

Official
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Medical Society

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North Carolina Medical Journal

For Doctors and Their Patients



Special Section:

*African-American Health and Medicine—
Black Medical Students: Nature or Nurture?
Caring for Patients with Sickle Cell Disease
Prostate Cancer in Black Men*

End-of-Life Issues—

A Thoughtful Death in 1999

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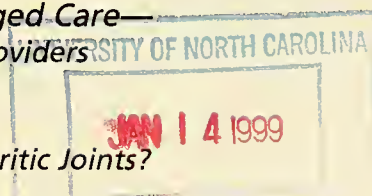
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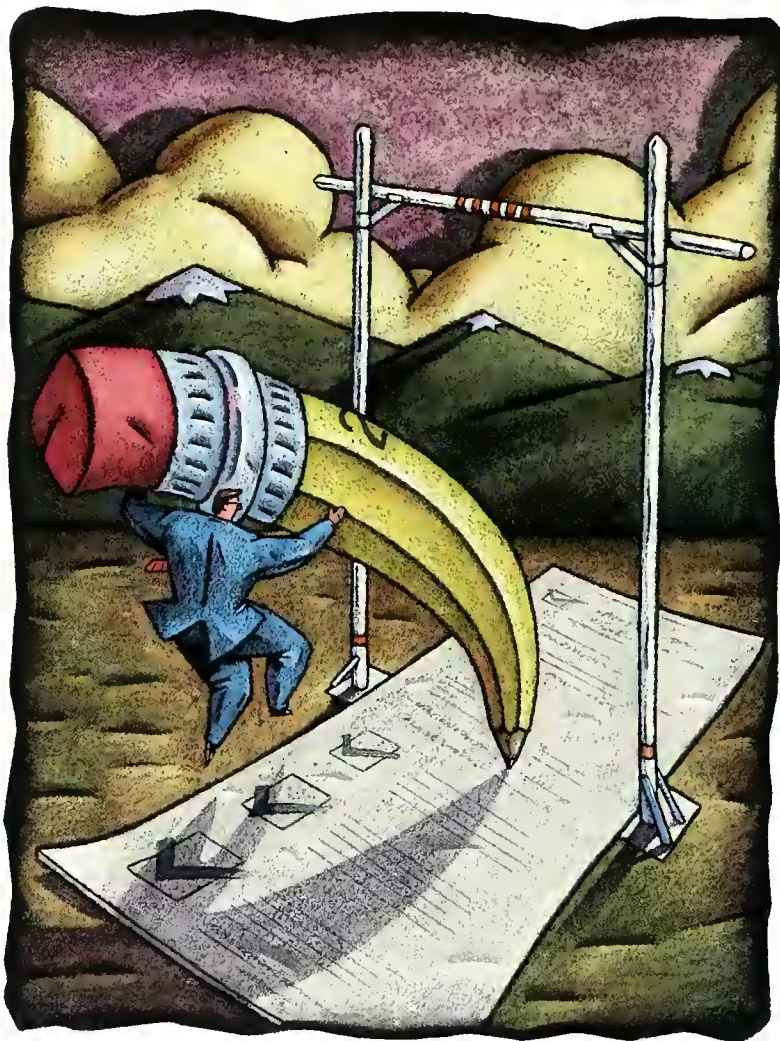
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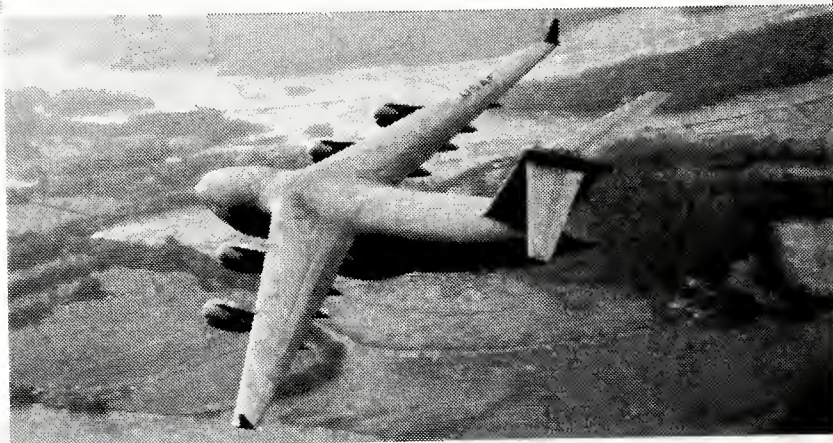
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NORTH CAROLINA MEDICAL JOURNAL

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North Carolina Medical Journal

FOR DOCTORS AND THEIR PATIENTS

January/February 1999, Volume 60, Number 1

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Instructions for Authors

The *North Carolina Medical Journal* is a medium for communication with and by members of the medical community of this state. The *Journal* publishes six times a year: in January, March, May, July, September, and November.

The *Journal* will consider for publication articles relating to and illuminating medical science, practice, and history; editorials and opinion pieces; letters; personal accounts; poetry and whimsical musings; and photographs and drawings. Papers that relate to the present, past, or future practice of the health professions in North Carolina are especially pertinent, but manuscripts reflecting other perspectives or topics are welcomed. Prospective authors should feel free to discuss potential articles with the editors.

Manuscript Preparation

Prepare papers according to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (N Engl J Med 1991;324:424-8) with the following exceptions: 1) no abstract is needed; 2) no running title is needed; and 3) report measurements in metric units; use of the International System of Units (SI) is optional.

Submit a cover letter and a 3 1/2-inch computer disk that contains the text written in MS DOS- or Macintosh-compatible format. *Also enclose three hard copies of the text for review purposes.* Double space text with one-inch margins. *Please do not "format" the text* (e.g. no variations in type size, no bold face, no italics, no embedded endnotes).

Submit photographic illustrations, in duplicate, as high-quality color 35mm slides or 5-by-7 or 8-by-10-inch glossy prints, or as black-and-white glossy prints (5-by-7 or 8-by-10-inch). Label all illustrations with author's name, number them sequentially according to their position in the text, and indicate the orientation of the images, if necessary. *Do not write directly on the backs of prints.* This can damage them. If figures require printing in four-color process, we may ask the author to pay printing fees or a portion thereof.

Submit tables, charts, and graphs as hard copy *and* include copies on disk, in their original format *and translated as TIFF, PICT, or EPS documents.* Type all figure legends separately. Type and double-space all tables, one to a single sheet of paper. Tables must have titles and consecutive Arabic numbers.

Keep references to a minimum (preferably no more than

15), retaining those that document important points. The "Uniform Requirements" cited above contain reference format. We customarily list the first three authors for "et al"-type references. Authors are responsible for the accuracy and pertinence of all citations.

Avoid abbreviations entirely if possible; keep them to a minimum if not. When used, completely define abbreviations at the first point of usage in the text.

Manuscript Review and Editing

A medically qualified editor reads all manuscripts and, in most instances, sends them out for further review by one or more other members of the North Carolina Medical Society. *Authors' cover letters must include a line that states that their submitted manuscripts are not under consideration for publication elsewhere. It is not the Journal's policy to reprint previously published articles.* Decisions to publish or not are made by the editors, advised by the peer reviewers.

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An Outward and Visible Sign

The *Journal* is Reprieved for Another Year

by Francis A. Neelon, MD

One of our friends, the lady who works in the library, stopped by to say that she had read of the Executive Council's May recommendation that publication of the *Journal* be suspended. She was pleased by the Society's vote at the Annual Meeting in November to continue publication for another year while the Editorial Board and the executive officers seek alternative funding to continue publication. "You know," she went on, "I have always looked at the *Journal* as an important symbol, sort of the way theologians look at sacraments: as an outward and visible sign of an interior grace and dedication."

That strikes us as fundamentally just the right spin. Many have commented on the affinity of medicine and religion. Western medicine began as a priestly art in the temples of ancient Greece, and even well into the 20th century Balint wrote of what he said could only be described as "the apostolic function of the physician."¹ He was forced to use a religious term because so much of what he saw doctors and healers doing lay (and must of necessity always lie) beyond the pale of science. Doctoring is, at its root, an act of faith and trust coupled with a body of knowledge, imperfect but expanding. Together these elements fuse to produce a peculiar and sometimes inexplicable hybrid we call "clinical wisdom." Science is important, but religious terms describe the deepest aspects of the doctor's job.

Debate about the *Journal* occupied a considerable part of the 1998 Annual Meeting, but another phenomenon surfaced there and is directly relevant to our position. The House of Delegates voted to distinguish "physicians" from "providers" such as nurse practitioners and psychiatric social workers and physician assistants. I certainly have no argument with that distinction, but I wonder on what doctors base it. Surely there is no obviously visible difference in the prescriptions written or the diagnoses entertained by the various classes of practitioner. I suspect that a silent observer visiting our clinics could not specify any visible difference in the approach to the patient, or the words used with the patient, or the behaviors manifested by these different kinds of practitioner. Yet doctors are convinced that there is a difference, one important enough to change the official language used by the Medical Society.

If there is no behavioral difference, what sign will doctors use to set themselves apart from other clinicians? Some say the length of training that doctors undergo (but there is little evidence that years of education are better than interest and enthusiasm); some say the depth of doctors' understanding of clinical physiology and psychology (although that sort of information rapidly becomes obsolete and few doctors would like to be tested on their retained stores of expertise in these domains); some say simply the mantle of authority cast over the shoulders of doctors by tradition and maintained by guild-like self interest. I say it is none of these. There is a difference, but it eludes simple definition or understanding. Coming to grips with the essence of what makes doctors doctors requires dialogue and reflection by doctors themselves. The *Journal* solicits and provides the opportunity for such dialogue. It lets us define what it is we are and what we do that sets us apart. In this sense it is an "outward and visible" badge of our enduring profession, of our quest to know what it is that makes us what we are.

During the next 12 months, the *Journal* will be searching for new ways to fund its continued existence. We will bring forth opportunities for the readers to assist with this as those opportunities arise. We are hopeful that those who get and read the *Journal* and appreciate what it does will be able to make a tax-exempt contribution to its continuation (we are exploring the details of how this would work). We will knock on the doors of those individuals and groups who are committed to the betterment of medicine in North Carolina. In the meantime, we solicit the input of the readers as to how we can put the *Journal* on a sure financial footing, one that will be independent of the members' yearly dues, that will ensure that we maintain our listing in *Index Medicus*, and keep the *Journal* as the Medical Society's gift to Medicine itself.

Reference

- 1 Balint M. The Doctor, His Patient, and the Illness. New York: International Universities Press, 1957.

Letters to the Editor

The Merit of Medical Savings Accounts

To the Editor:

I respond to the comments invited from readers of the statement of the Bioethics Committee of the North Carolina Medical Society on "The Role of the Medical Profession in a Managed Care Environment," which was published in the March/April *North Carolina Medical Journal*.

I have practiced primary care in North Carolina since 1982, and I agree with this position wholeheartedly. I would only add that the obvious mechanism to achieve these goals is to encourage the state legislature to adopt tax policy that allows tax-deductible medical savings accounts (MSAs) for all its citizens. This would "level the playing field" and remove the preferential tax treatment of employer-sponsored health insurance, thereby empowering individuals to regain control of their own health care purchase decisions.

I encourage readers who are uncertain of the advantages of MSAs to contact the American Association of Physicians and Surgeons for more information, a group of which I am proud to be a dues-paying member.

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Saving the Journal: What Are the Odds?

To the Editor:

The most hotly debated issue this year at the NCMS Annual Meeting was whether or not the *Journal* should continue to be funded or should it be dropped from the general budget, as has happened to so many other state medical journals in recent years.

Passionate testimony was presented by both sides of the controversy during the Reference Committee hearing. The *Journal* was established in 1849; it is a peer-reviewed and an internationally indexed document, and has been in continuous publication, except for a few years during the Civil War, for 150 years. It provides a unique forum for the North Carolina medical community, including medical students and residents, that is not duplicated by any other existing publication.

On the other hand, the *Journal* costs the Society approximately \$150,000 per year in a time of membership decline and

when increasing funds are needed to lobby for needed tort reform and legal council to safeguard physicians against unfair managed care practices. Several physicians maintained that *Journal* readership is insufficient to warrant its continued existence. Many said they felt that the most appropriate action would be to discontinue funding immediately, without so much as a "swan song" issue.

Options to save the *Journal* include soliciting paid subscriptions to support the publication, but it is unlikely that sufficient subscriptions could be sold to pay for it, not to mention the costs of additional personnel to oversee the subscription process. Petitioning industry for money to pay publication cost is always an option, but one must also remember: a free press is not bought. Major investors in any business expect a return on their dollar. It is unlikely that the Editorial Board would remain unrestrained if the *Journal* were subsidized by industry. And if the Medical Society's link to the *Journal* were severed, it would have to establish a whole new identity.

Both arguments have merit. But the bottom line remains: Despite the approximate \$45,000 earned annually from advertising revenue, the *Journal* does not generate money and is fiscally impractical. Pragmatically, in this day and age of efficiency and cost containment, one might say that it has outlived its usefulness. Does anyone rejoice in such a proclamation? Is this what we want for the profession of medicine? Do we not still believe in the intangible benefits—that we are made better and more unified—by retaining a voice in North Carolina?

Medicine is not just the bottom line—it is art and science; it is interpersonal skills and academia. Medical literature has always been the primary medium for the exchange of scholarly ideas and the herald of medical advancement. Without state journals, how do physicians debate local current issues of managed care, malpractice, and physician-assisted suicide? Where do residents publish the case report of their "once in a lifetime" diagnosis? National newsletters and journals cannot replace the *Journal*. Once it is gone, it will be gone.

The House of Delegates' final decision at the Annual Meeting was a compromise: The Medical Society will support the *Journal* until January 1, 2000. After that time, the *Journal* must be self-sufficient and self-supporting or it will no longer exist. Odds are, it will no longer exist.

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Prostate Cancer in African-American Men

Mitchell S. Anscher, MD

Prostate cancer is the number one cancer in US men (in 1997 there were 210,000 new cases).¹ The incidence in African-American men is 75% higher than in Caucasians, and the corresponding mortality is more than twice as high.² The problem is particularly severe in North Carolina, where African-American men have the highest incidence of prostate cancer in the world³ and a mortality rate that is 2.5 times greater than the white population.³ The disparity in prostate cancer in US blacks and whites has been recognized for many years,⁴ but only recently has there been a real research effort to identify the underlying reasons for this. In this paper I look at clinical and biological aspects of prostate cancer that may account for its disproportionate impact on African-Americans, and discuss strategies that may improve this situation in the future.

Epidemiology

From 1973 to 1994 there was a marked increase in both the incidence of and mortality from prostate cancer in African-American men.² The age-adjusted incidence increased by 140% to 230/100,000, but that in Caucasians increased by only 130% to 130/100,000; mortality rates increased by 41% in blacks and 19% in whites. There was a shift toward diagnosis at an earlier stage in both African-Americans and Caucasians, but despite this trend toward earlier diagnosis, blacks still present with more advanced-stage prostate cancer than whites.⁵ Mettlin et al⁵ found that twice as many black men had distant metastases at diagnosis, and the tendency for blacks to present with more advanced disease runs across socioeconomic levels.⁶

Despite the gloomy incidence statistics, prostate cancer survival rates in the African-American population have improved markedly. Hsing and Devesa⁷ reported that the five-year survival rate for blacks rose from 35% during 1960-1963 to 64% in 1983-1989. Stage-specific survival has also improved. The five-year survival in blacks with localized prostate cancer

rose from 58% during 1955-1959 to 86% in 1983-1987. Still, stage-specific survival for African-Americans lags behind that of Caucasians.⁸

Socioeconomic Factors

Financial and cultural barriers to health care contribute to the tendency of African-Americans to present with more advanced prostate cancer. Because African-Americans have been underrepresented in previous cancer control and intervention efforts,⁹ we have only sparse information about the knowledge and beliefs of the African-American population regarding prostate cancer. Several recent studies indicate that blacks lack knowledge about prostate cancer, a deficiency that must be overcome if early detection is to become the norm. For example, less than half of black men in one survey knew that race is a risk factor, and fewer blacks than whites knew that family history is important.¹⁰

Common beliefs about prostate cancer in the black population pose barriers to early detection and treatment. For example, Demark et al¹⁰ found that blacks were less likely than whites to ever have had a digital rectal exam or prostate specific antigen (PSA) measurement. According to Myers et al,¹¹ concern over discomfort or embarrassment or fear of an abnormal result may lead blacks to forgo an examination. In addition, blacks are less likely to believe that a man with prostate cancer can live a normal life, or that this malignancy can be cured if found early.¹⁰ And when prostate cancer has been diagnosed, blacks are more likely to delay treatment than are whites.¹² Nevertheless, Myers¹¹ found that most black men would consent to screening for prostate cancer if they believed in its efficacy. The value of screening for carcinoma of the prostate remains highly controversial. The most recent Surveillance, Epidemiology and End Results (SEER) Program data suggest that the widespread use of PSA has led to earlier diagnosis of prostate cancer without conclusively proving the value of screening and early treatment.⁸

Screening for prostate cancer remains the subject of inten-

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sive research, and it is important to understand the feelings of black men about participation in clinical trials in order to recruit sufficient numbers into screening studies. Unfortunately, the shadow of the Tuskegee study looms large as a barrier to participation.¹³ Robinson¹⁴ found African-American men suspicious about medical experimentation and mistrusting of the medical establishment. Some specifically cited the Tuskegee study as a reason for their concern. These men were more likely to participate in research studies if they were encouraged to do so by a physician or researcher whom they perceived to be competent and caring. Paskett¹⁵ identified eight recruitment strategies, addressed to cultural and economic issues, which successfully enrolled African-Americans in a national prostate cancer prevention and control study. A broad-based approach seems necessary if all socioeconomic groups are to be included, since middle class black men seem more willing to participate in prostate cancer screening than less affluent blacks.¹⁴ Furthermore, efforts at education and screening that are solely church-based tend to omit African-American men from lower economic strata.¹⁶

In addition to cultural impediments, economics affects the diagnosis and treatment of prostate cancer in African-Americans. Nearly 20% of black men say cost is a barrier to examination.¹⁷ In addition, the patterns of treatment for prostate cancer in this country indicate disparities across racial lines.^{18,19} African-Americans with prostate cancer are less likely to undergo radical prostatectomy than are white patients.¹⁸ In the SEER data base,¹⁹ this held true even after adjusting for stage and grade of the tumor, suggesting that lack of access may contribute to disparate treatment. In an equal access system such as the US Veterans Affairs hospitals, there was no difference in treatment strategy for black or white prostate cancer patients,²⁰ and race had no effect on survival. This suggests that elimination of financial barriers could reduce or eliminate racial differences in treatment and outcome.

Clinical and Biological Factors

A number of clinical and biological factors have been evaluated in an attempt to account for the higher incidence and mortality of prostate cancer in African-American men. One example is the circulating hormonal milieu, which might contribute to the higher risk of prostate cancer in blacks. Testosterone and its metabolite, dihydrotestosterone, are important regulators of prostate growth, but measurement of circulating androgen levels have shown no consistent differences between blacks and whites.²¹⁻²³

Diet may contribute to the development of prostate cancer. The diet of African-Americans tend to be higher in saturated fat than that of whites, and a high-fat diet is associated with higher circulating androgen levels and an increased risk of prostate cancer.²⁴ A diet high in fiber can lower testosterone levels. Whittemore²⁴ estimated that about 20% of prostate cancer cases in all ethnic groups could be attributed to dietary factors, but

that would explain only about 10% of the difference between African-Americans and Caucasians. Other factors must also be important.

No specific heritable factors have been identified to account for the increased incidence of prostate cancer in African-American men, but population-based studies suggest the influence of genetic influences. Whittemore²⁵ found that the relative risk of developing prostate cancer based on family history was the same across racial lines. The data predicted the existence of one or more predisposing genes that conveyed an increased risk of prostate cancer. The authors estimated that a prevalence of these genes of 0.6% in the white and 6% in the black population would completely explain the differential incidence of prostate cancer in the two populations.

There appear to be important differences in the incidence of premalignant lesions of the prostate in African-American versus Caucasian men. Sakr et al²⁶ found that high-grade prostatic intraepithelial neoplasia and latent prostate cancer were more common at autopsy in blacks, and seemed to develop about 10 years earlier in blacks than in whites. There was no racial difference in the frequency of latent prostate cancer (previously undetected cancer found incidentally at autopsy). These data imply that African-Americans need to be screened at earlier ages than whites.

Another important issue concerns possible racial differences in PSA. Several studies suggest that African-Americans with equivalent stage and histologic grade of prostate cancer have a higher PSA at diagnosis than do Caucasians.^{27,28} Moul²⁸ found that, in both blacks and whites, tumor volume and stage correlated with preoperative PSA, suggesting that blacks, stage for stage, present with a greater tumor burden than whites.^{16,28}

Differences in tumor burden at diagnosis may help explain why tumor registry-based studies, which do not account for differences in PSA, show lower survival rates in African-Americans than in whites. Vijayakumar et al²⁷ found that, due to screening and increased awareness, the PSA levels of African-American patients at presentation are lower than in the past, and equivalent to those of whites. We anxiously await studies that take tumor burden into account in comparing treatment outcome.

Even in men without prostate cancer there are racial differences in PSA levels²⁹ (African-American men have higher values than whites.) The reason for the difference is unknown, and cannot be accounted for simply by differences in the volume of the prostate gland. Since these studies were performed in equal-access environments, it is unlikely that socioeconomic factors contribute. Perhaps PSA reflects the earlier onset of premalignant lesions in the African-American population, since patients with prostatic intraepithelial neoplasia may have higher levels than patients with benign prostate glands.³⁰ Age- and race-adjusted normal levels of PSA have been proposed that would achieve 95% sensitivity in screening for prostate cancer.²⁹ Different PSA thresholds may be appropriate for blacks and whites, and screening may need to commence at different ages in the two groups.

Conclusions

African-American men have a very high incidence of prostate cancer, and they tend to have more extensive disease at diagnosis than do Caucasian men. Much remains to be done to overcome cultural and economic barriers to health care since it appears that (after correction for volume of cancer) the results of treatment may be the same for blacks and whites. Men of both

racesshould reduce their intake of saturated fats because this appears to reduce the risk of developing prostate cancer. Further research is needed to identify heritable factors that may identify black (and white) patients at particularly high risk. Black men should be encouraged to participate in prostate cancer screening trials, so that sufficient numbers are accrued to accurately define the role of screening in this population. □

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Caring for Patients with Sick Cell Disease in North Carolina

Marilyn J. Telen, MD, Glenda Harris, MSA, and Elaine Whitworth, MSW

Nearly six million people live in North Carolina. More than half live outside city areas, making ours the only state with a majority of rural residents. Twenty-two percent of North Carolinians are African-American. In 1996, 2300 North Carolina children and adults had been diagnosed with sickle cell disease, and it is probable that another 450 remained unidentified.

Medical centers, state agencies, and community-based organizations around the state have worked hard to redress the disadvantages of rural people with limited access to adequate medical care. As part of this effort, these agencies have coordinated the activities of diverse people with a common commitment to patients with sickle cell disease. It is gratifying, but not surprising, that North Carolina has become a national model for innovation and excellence in the diagnosis, treatment, and research of sickle cell disease.

The First Sick Cell Center in North Carolina

In 1974, Dr. Wendell Rosse began a Sick Cell Clinic at Duke University in Durham. He wanted to improve the treatment of patients with the disease, provide a referral point for physicians, and facilitate clinical research in sickle cell disease. Early on, he collaborated with North Carolinians who were interested in improving the diagnosis and care of patients with the disease. A community group in Greensboro, led by Leo Bradsher, asked Dr. Rosse to serve on its advisory board. This led to an outreach clinic in Greensboro staffed by physicians from Duke. There soon followed a second collaboration with a community group based in Fayetteville, led by Mary McAllister. The Duke

program was expanded to include pediatric patients when Dr. Thomas Kinney came from the Children's Hospital of Philadelphia to establish the pediatric sickle cell clinic and undertake a number of clinical studies. In 1980, Dr. Russel Kaufman established the Duke Hemoglobin Diagnostic Laboratory, an outgrowth of which was the state testing program (for which the lab serves as a reference laboratory).

The research and clinical activities of the Duke Comprehensive Sick Cell Center were supported for 15 years (until 1998) by the National Institutes of Health. The Center was expanded in 1986 when Duke began collaborating with UNC-Chapel Hill (UNC-CH). The UNC-CH efforts were led by Kermit Nash, PhD, and Eugene Orringer, MD. Dr. Nash was active on local, state, and national levels in organizing and performing research and strengthening clinical efforts in the psychosocial aspects of sickle cell disease. His death in January 1998 was a great loss for the medical community in North Carolina. Dr. Orringer runs an adult sickle cell clinic and conducts research into the physiology of sickle cell red cells and sickle cell disease. In 1992, the Center again expanded to include East Carolina University Medical Center's active pediatric clinic, which has contributed a large body of clinical research to the sickle cell disease effort through the efforts of Drs. Charles Daeschner and Beatrice Files.

The Governor's Council on Sick Cell Syndromes

The affiliation of community organizations that helped form the origins of the Duke Comprehensive Sick Cell Center energized efforts to have state government start a program to help patients with the disease. The Governor's Council on Sick Cell Syndrome, created in 1973, comprises a broadly representative membership of leaders of community-based programs, parents, patients, public school educators, African-American physicians, religious and labor leaders, and others

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actively concerned with improving the conditions for persons with sickle cell. The first Council was chaired by Dr. James Greene, of Henderson, and included Dr. Rosse as a founding member. The Council continues to guide state policy regarding the disease. It was instrumental in the setting up of state programs (described below) for the early diagnosis of sickle cell disease and for the education and care of patients with it. Gladys Robinson, head of the Sickle Cell Disease Association of the Piedmont (in Greensboro) is the current chair of the Governor's Council.

The Council, which meets at least four times a year, has spearheaded the broadly based, publicly funded program now in place throughout the state. Through the efforts of its executive committee and standing committees on Education and Counseling and Legislative Affairs, the Council has progressively shifted its role from direct action to that of advisor to the Governor and the Department of Health and Human Services. During 1995-1996, the Governor's Council collaborated with the Division of Maternal and Child Health to:

- institute a rule change allowing all children to be eligible for Purchase of Medical Care Services Program funds, which reimburse patients for medical expenses;
- successfully recruit a program manager for the North Carolina Sickle Cell Syndrome Program (NCSCSP), (the information the program provided led legislators to reject a proposal to privatize NCSCSP);
- cosponsor a Sickle Cell Disease Conference;
- provide oversight for the development of a NC Sickle Cell Syndrome Program client database; and
- cosponsor a retreat for training and education of Council members on issues surrounding privatization, establishment of partnerships with organizations advocating for other chronically ill individuals, and the construction of networks with other state health care institutions.

The Medical Centers: Comprehensive Care and Advances in Treatment

A number of North Carolina medical centers (Duke Comprehensive Sickle Cell Center, UNC Comprehensive Sickle Cell center, ECU School of Medicine, Wake Forest University School of Medicine, and Carolinas Medical Center, Charlotte) now provide comprehensive care for patients with sickle cell disease and related hemoglobinopathies. Fifteen years ago, funding from the NIH helped Duke begin its Comprehensive Sickle Cell Center activities. UNC and, five years later, ECU joined this endeavor to improve care for sickle cell patients. The termination of NIH funding in 1998 was a great loss for patients with sickle cell anemia in this state. Nevertheless, Duke, UNC, and ECU continue to participate in nationwide cooperative research efforts to learn more about sickle cell disease, and to improve treatment. Their research efforts have included:

The multicenter study of hydroxyurea. From 1988-1991, Duke

and UNC participated in an NIH-funded, Phase I multicenter study of the safety and pharmacology of hydroxyurea (HU) in the treatment of adult patients with sickle cell anemia (SCA). This study established that HU, which decreases sickling by increasing the concentration of fetal hemoglobin, could be given safely to patients with SCA. It also demonstrated that chronic administration of HU produced at least some degree of hematologic improvement. This pilot study formed the basis for the larger Multicenter Study of Hydroxyurea (MSH).

Both Duke and UNC participated actively in the MSH, the first Phase II study to show that a pharmacological agent could actually change the natural history of SCA. The MSH was a randomized, double-blinded, placebo-controlled trial that involved 21 participating centers and 299 study subjects. The primary end point was the frequency of painful vaso-occlusive events or "crises." The study showed that the median number of crises experienced annually by HU-treated subjects was 2.5 compared to 4.5 in the placebo-treated subjects.¹⁻³

Phase I-II trial of hydroxyurea treatment in children (HUGKIDS). Because of the striking success of HU in adults with sickle cell disease, a cooperative study of its use in children was begun, with the Duke-UNC Biometry Core serving as the national data coordinating center. The study seeks to determine: 1) whether HU will increase the concentration of fetal hemoglobin, hematocrit, and mean red cell volume; 2) whether the therapeutic dose in children is similar to that in adults; 3) whether the hematologic and renal toxicities of HU are the same in children as in adults; and 4) whether HU produces adverse effects on growth in children. The study was set up to study effects on hematological variables and to determine toxicity, but data on clinical efficacy (numbers of painful episodes) are being collected, and the cohort of patients will be followed. Smaller studies indicate promise for the use of HU in children.⁴

The study of preoperative transfusion. Duke, UNC, and ECU participated in this national, cooperative, multicenter comparison of aggressive versus conservative blood transfusion before surgery in sickle cell patients. The results showed that the rate of serious complications was 31% in patients who received aggressive transfusions and 35% in those who got simple replacement transfusion. However, there were more transfusion-related complications in the aggressively transfused patients. This study also delineated the variety of complications that occur in conjunction with surgery in these patients.^{5,6}

Multicenter study of acute chest syndrome in sickle cell disease. This national study was designed to identify the etiology, pathogenesis, and natural history of acute chest syndrome, a particularly serious problem for children and adults with sickle cell disease. The recently published results⁷ show that, although much remains to be learned about this syndrome, it most likely has multiple precipitating causes and that aggressive treatment early in the course of the disease can improve outcome.

The "STOP" stroke prevention trial. This national multicenter study, led by Dr. Robert Adams from the Medical College of Georgia, used transcranial Doppler flow study of the carotid vessels⁸ to identify children at risk for stroke. Those at risk were then randomized to chronic transfusion therapy or observation alone. It appears that prophylactic transfusion can prevent cerebrovascular accidents.⁹ However, since many children who have abnormal Doppler exams do not develop strokes, there is a danger that transfusion therapy will lead to the deadly complication of iron overload. We need better ways of predicting and preventing stroke so that we don't have to risk a life-threatening complication in those who don't need treatment.

Other ongoing research. Individual medical centers carry out a variety of research pertinent to sickle cell disease. We continue to test new therapies for the treatment of painful episodes, and new ways to treat avascular necrosis of shoulder and hip joints (including a nationwide multicenter trial of core decompression for this problem). Scientists research the basic mechanisms of vaso-occlusion, the role of activation of coagulation, and possible ways to use gene therapy for this disease. Both Duke and UNC have successfully performed a small number of bone marrow transplants in children with sickle cell. Thus, the medical centers of North Carolina continue to be leaders in both the care and treatment of patients with sickle cell anemia.

The NC Sickle Cell Syndrome Program

NCSCSP aims to reduce morbidity and mortality from sickle cell disease and to provide a comprehensive health model for sickle cell syndrome services. Provision of services through this program is a collaborative effort between regional sickle cell educator/counselors, medical centers, community-based programs, and health departments. NCSCSP has contractual agreements with the six medical centers that provide comprehensive services to persons with sickle cell disease.

The Program offers a wide range of services: newborn screening of all infants at no cost; hemoglobinopathy testing at local health departments; state laboratory services for accurate diagnosis; educational services to the general population; reimbursement of medical bills for eligible patients; and medical center follow-up, social support, and referral services. Educator-counselors and community-based centers provide genetic counseling, education, service coordination, and social support services. Each state-funded educator/counselor carries an average caseload of 147 patients. During the 1995-1996 fiscal year, over 15,000 services related to comprehensive patient management were provided to 2636 individuals with sickling syndromes.

Education and genetic counseling. More than 3000 educational sessions were attended by over 122,000 people in 1995-1996. These sessions included education and counseling for patients and families affected by sickle cell syndromes, and

workshops and conferences for health professionals and the lay public. Genetic counseling is offered to all persons identified with sickle cell disease, sickle cell trait, and other hemoglobinopathies. In 1995-1996, genetic counseling was provided to over 599 persons with sickle cell disease and 1561 persons with sickle cell trait.

Universal newborn screening. Universal newborn screening for abnormal hemoglobins was begun in May 1994. The state laboratory screened 47,390 infants (and approximately the same number of children and adults) for sickle trait in 1993-1994. The laboratory processes specimens within 24 hours. During the 1995-1996 fiscal year, the state lab identified 6192 persons with sickle cell trait (including 3379 infants), and 101 infants with sickle cell disease.

Reimbursement program. NCSCSP reimburses for services related to sickle cell disease provided to financially and medically eligible adults, and to children who cannot obtain services through physicians listed with the Children's Special Health Services Program. Patients must be financially eligible based on the income scale of the Purchase of Medical Care Services Payment Program. NCSCSP covers hospitalization, outpatient physician services, drugs, therapies (physical, occupational, and speech), rental of appliances, supplies, dental care for children, preventive and limited maintenance dentistry for adults, eye care when coverage through the Division of Services for the Blind is unavailable, and obstetrical care (excluding delivery) if coverage cannot be obtained through Women's and Children's Health high-risk maternity clinics.

Partnership with the medical centers. NCSCSP's contractual agreements with various medical centers ensure that patients receive high-quality medical treatment. They stipulate that all persons with sickle cell disease receive comprehensive services (including all medical and surgical services required by sickle cell disease and its wide range of complications), physician education, physician referral consultation, psychosocial services, community satellite clinic services, and patient education and counseling. Educator-counselors work closely with medical center personnel. They attend sickle cell clinics to assist with patient identification, referral, and transportation, and provide follow-up to ensure that all aspects of the comprehensive care plan are implemented and maintained.

The Community-Based Sickle Cell Centers

NC has four community-based sickle cell centers: the Sickle Cell Disease Association of Southern Piedmont (Charlotte), Sickle Cell Disease Association of the Piedmont (Greensboro), Operation Sickle Cell (Fayetteville), and the Sickle Cell Disease Association-Eastern North Carolina chapter (Jacksonville). The local centers' primary responsibility is to provide, at no cost to patients and families, community education and case

management services for individuals with sickle cell disease. Some centers also provide hemoglobinopathy screening, genetic counseling, child care coordination, satellite clinics, summer camps, home health care tutorial services, and psychological counseling.

Education services offered by community-based centers promote awareness of sickle cell disease among lay and professional audiences through programs in public schools and colleges, civic and community organizations, and health fairs. There is special emphasis on education oriented toward health and human services professionals. In collaboration with the state educator/counselors and medical center staff personnel, community-based centers also provide genetic counseling to all persons with abnormal hemoglobin.

Case management services generally include initial assessment of each patient and reassessment every six to 12 months. The assessments, which encompass medical, economic, family, school or employment, psychological, and educational aspects, are reviewed by the health care team (nurse-coordinator, social workers, educator/counselors) in order to develop a care plan for each patient and make referrals to health and human service agencies within the community. Support services include financial certification for medical care (for the Purchase of Medical Care Services Program, NC Health Choice, and Medicaid), child care coordination, employment assistance, support groups for patients, teens, and families, financial assistance, and transportation to sites of medical care.

The NC Consortium for Sickle Cell Disease

The North Carolina Consortium for Sickle cell Disease consists of Duke, UNC-CH, ECU, Charlotte Memorial Hospital, and Wake Forest medical centers, the four community-based sickle cell centers (Charlotte, Greensboro, Fayetteville, and Jacksonville), and representatives of the NC Sickle Cell Syndrome Program. The consortium includes health care providers at all levels, as well as patients and interested lay persons. The Consortium meets quarterly to discuss current activities, plan future collaborative efforts, and update each other on local, state, regional, and national developments.

The NC Consortium was a major force behind the Newborn Screening Program. It sponsors an annual sickle cell meeting that attracts statewide interest and attendance. The consortium, in collaboration with NCSCSP, has developed minimal care standards for children and adults with sickle cell anemia. The Consortium recently surveyed medical practitioners in North Carolina regarding knowledge deficits and to determine the most helpful methods of continuing education.

Consortium members, working together to improve the care available to patients, have made North Carolina a national leader in all phases of sickle cell disease-related activities. And thanks to the efforts of many medical and lay leaders, North Carolina has made available excellent health care services to all sickle cell patients, regardless of their ability to pay. This is an achievement we can all be proud of. □

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Underrepresentation of African-American Male Medical Students

Nature or Lack of Nurture?

Mark A. East, MD, and Gregory Strayhorn, MD, PhD

African-American students are underrepresented in United States medical schools. If they were proportionately represented in medicine, African-Americans would comprise nearly 11.5% of the roughly 587,000 physicians in the US. Instead, only 3.6% (20,874) of physicians are African-American.¹ These statistics are alarming, and despite some gains in the 1970s, there has been little further progress toward the goal of increasing the number of African-American medical students.

The annual number of African-American students entering medical school reached a plateau of just less than 1000 in the late 1970s, declined during the early 1980s, and has increased only slightly since. In 1989, the number of African-American matriculants surpassed 1000 for the first time. However, according to Ready and Nickens,² this modest increase does not indicate meaningful progress because of the growth of the African-American population overall. Furthermore, the slight gains made since the 1970s have been made primarily by African-American women (although they, too, remain underrepresented in medicine). The number of African-American men who entered medical school in 1971 has not since been equaled and declined steadily until 1985, when enrollment reached a nadir, 30% below the level of 1971.² African-American men have made marginal gains in enrollment since 1985, but there is little reason to expect substantial progress in the future unless we understand the factors behind the problems. In this paper, I discuss the historical factors relating to this issue (especially those specific to African-American men), drawing on personal experience to explain the declining number of African-American male matriculants to medical school.

Increasing Underrepresented Minorities in Medicine

In 1968, medical schools formally responded to the underrepresentation of African-American medical students when

the Association of American Medical Colleges (AAMC) recommended that medical schools admit increased numbers of students from inadequately represented geographical areas, economic backgrounds, and ethnic groups. In 1969-1970, an AAMC task force investigating minority underrepresentation in medical schools recommended that African-American students comprise 12% of all first-year medical students by the 1975-1976 academic year.³

Despite efforts to increase the enrollment of African-American medical students, the goal was not achieved. In 1975-1976, only 6.8% of all first-year medical students were African-American.⁴ Despite higher acceptance rates due to affirmative action policies, the AAMC's goals were not accomplished because so few African-Americans applied.⁵ The conclusion was that in order to better represent African-Americans in medicine, the pool of qualified applicants must be expanded, and this holds true today.

At the time the AAMC was setting out its initiatives, the American Council on Education and the Education Commission of the States appointed a Commission on Minority Participation in Education and American Life. The Commission's report, *One-Third of a Nation*, concluded that America was moving backward—not forward—in its efforts to achieve full participation of minority citizens in the life and prosperity of the nation. From 1966-1976, the proportion of African-American college students increased from 5% to 10% of the college population.⁶ However, at both college level and graduate level, these trends would eventually reverse for the African-American male.^{2,7}

The Declining Rate of African-American Male Applicants

In 1976, African-American students enrolled in college at about the same rate as white students. In that year, 35.4% of both

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African-American and white men who had graduated from high school were attending college. African-American students composed 9.4% of all the students enrolled in institutions of higher education. By 1988, however, the percentage of African-American male high school graduates attending college fell to 25%, while the enrollment of white men rose to 39.4%. African-American men were the only segment of the population to register a decline in terms of absolute numbers (only 297,000 African-American men were enrolled in college in 1988, compared to 331,000 in 1978³). The decline occurred despite a 9% growth in the total numbers of African-American men age 18-24, and a 21% increase in the number of African-American men who were high school graduates.⁸

The Division of Community and Minority Programs (DCMP), established by the AAMC in December 1988, and incorporated in its section of Minority Affairs (created in 1969), focuses on some of these issues. One program of this committee, *Project 3000 by 2000*, seeks proportional representation in medical schools by underrepresented minority students (African-American, Alaskan native, American Indian, native Hawaiian, Mexican American, and mainland Puerto Rican). The project hoped to increase the number of matriculates each year, reaching 3000 entrants by the year 2000. The project has not succeeded. In 1997, 1770 underrepresented minority students entered US medical schools, a decline from 2014 new entrants in 1994. African-Americans males made up a dismal 2.7% of new matriculants in 1997.¹

It is clear that the declining number of qualified African-American male applicants to medical school is due, at least in part, to the declining number of African-American men who pursue higher education. Even though African-American men begin the educational process with other members of society, they do not reach the same endpoints or achieve the same levels of success as the rest of society. Why? Is this phenomenon a function of an inherent inability of African-American men to achieve beyond high school in ways comparable to the rest of society? Or are institutional and social factors responsible for the declining number of African-American men entering medical school?

A Genetic Endowment of Achievement?

Some have argued for a genetic basis for the differences between African-American and white students in IQ test scores. Jensen⁹ postulated that roughly 80% of the variance in IQs was due to genetic factors and 20% to environmental influences. However, the findings of Jensen and other investigators who try to explain differences in African-American and white student achievement by inherent genetic factors suffer from many problems in study design. In fact, according to Ogbu,¹⁰ no existing studies show that specific genes linked to lower IQ are found disproportionately in African-Americans compared to whites. Nor are there studies showing that specific genes linked to conceptual skills, abstract thinking, or problem solving are

more often found in whites than African-Americans.¹⁰ Finally, no studies demonstrate empirically that gene-controlled deficiencies in mental ability are more common in African-Americans than whites.¹⁰

Is Proportional Representation in Medicine Important?

I think that, ideally, the percentage of physicians should reflect the societal percentage of each race. Assuming that similar proportions of minority students want to become physicians, and assuming that they have the genetic ability to succeed (which I think is evident), the issue of proportional representation becomes an issue of equal opportunity and support. However, since race in the US embodies a history of oppression and unequal opportunity, which some think persists today, and since African-American men continue to bear a disproportionate burden of societal faults, we cannot realistically expect proportional representation of African-American males without clear initiatives to address the problems facing them today.

Unlike whites, African-Americans are not propelled socio-economically by their immediate environment. A profile of the 1996 applicants accepted by US medical schools revealed that 8.6% of African-American fathers, but only 2.5% of white fathers, had less than a high school education. Furthermore, 8.7% of fathers of African-American males had a professional degree (MD/DO/JD/PhD) compared to 15% of white fathers; 6.9% of African-Americans had a parental income of less than \$10,000 per year compared to 1.7% for whites; and 9.4% of African-Americans had an income of \$100,000/year or more compared to 24.2% of whites.¹ It is not entirely clear exactly what role these factors play, but I think they make African-American males less inclined to develop "effort optimism" because they do not see the payoff in terms of job and financial security for their parents. The role of social factors like television and radio, educators and administrators is, I think, enormous.

Institutionalization of a Negative Perception of African-American Men

Compared with their white counterparts, African-American men in the US bear a disproportionate burden of crime, poverty, and other social problems. An African-American man has an approximately 5% lifetime chance of being murdered;¹¹ more than 600,000 (of 2.4 million) African-American males age 20-29 are in jail, on parole, or on probation.¹² Furthermore, 62% of African-American births occur out of wedlock.^{10,11} Ogbu observed that how whites interpret social reality and the place of minorities within it determines the education offered to minorities.¹⁰ This raises the question of whether educators at all levels associate African-American male students with the negative image of African-American men in American society, fail to

nurture them through the educational system, and prevent them from achieving their potential.

In their study of the causes of long-term consistency in school performance from grades 1-3 to grades 4-9, Entwisle and Hayduk¹³ found that later school performance was related to cognitive ability, but also to early influences of parents and teachers. Their findings suggest that patterns of academic performance are established early, and that the social context within the classroom is important for how these patterns of learning get established and maintained.¹⁴ I think, based on personal experience and the above data, that African-American males are neither expected nor encouraged to achieve academically to the same extent as their white counterparts.

Based on observational data,¹⁰ Ogbu concluded that a modified caste system prevented most African-American students from crossing cultural boundaries or achieving academic success. Teachers' perceptions of their African-American students were molded by the teacher's cultural perceptions and historical experience; African-American students were viewed in terms of their birth ascribed status.¹⁵ That is to say that a African-American student's poor position in American society follows him into the classroom, and the negative classroom perception of African-American male students by educators and others is partly responsible for the lack of nurturing and support. Ensminger and Slusarcick¹⁴ observed that aggressive behavior in first-grade boys led to later dropout. They contend that a negative stereotype of African-American males works with other factors such as aggressive behavior to lower teachers' expectations and hopes for African-American male children. This ultimately leads to inferior education and lower school performance. Instead of handling this adversity in a productive manner, African-American men are assigned to remedial and "special" education.

African-American Male Perspective and Response to Inferior Education

How African-American men perceive and respond to teachers may be the most important factor in determining their fate. Inferior education contributes to lower school performance, and children whose schools do not stress academic curricula do not perform as well on academic tests as children whose schools do.¹⁰ Given that African-American male students have disproportionate assignment to special-education classes, higher expulsion rates, and overall lower achievement levels than white males,¹⁶ it is unlikely that African-Americans will have a competitive advantage over other students. African-American male students are victimized by their psychological response to inferior education, which derives from the negative perceptions of African-American men. Together, the factors lead to academic failure.

The education-related discrimination toward African-Americans, in particular African-American males, disillusion African-Americans about the worth of schooling.¹⁰ This disil-

lusionment, in turn, prevents them from developing "effort optimism" or perseverance to maximize their school performances. I recall many academically gifted African-American men who, finding that the social and economic rewards were not proportionate to their educational efforts, developed a "What's the use of trying?" attitude. Unless encouraged spiritually, or at home, they were lost because the school system simply failed to capture their attention and nurture them. I believe that African-American men are perceived to be inferior academically and are not taught to succeed.

Summary

Many educators contend that children are our greatest resource, and that educators are responsible for equipping children for a rewarding and constructive place in society.^{17,18} One educator has said that "African-American children need somebody to care about them. They need somebody who wants them to learn, who believes they can learn and who gives them the kind of experiences that enable them to learn."¹⁶ However, educators, like the rest of society, equate African-Americans with images of crime (drug dealing, robbery, murder), illegitimate children, and unemployment; they resist providing the kind of experiences that promote future success by students. Some individuals believe this may be an unconscious attempt to dismiss a problem by eradicating its source.

Twenty-five percent of African-American men end up in prison, on parole, or on probation, all of which significantly contributes to African-American male underachievement. A number of studies suggest that the educational system perpetrates this negative reality. The way African-American men are perceived by society and those in the educational system drives higher suspension rates, higher expulsion rates, lower achievement levels, and disproportionate assignment to special education classes. The data suggest that the African-American male applicant pool and rates of matriculation at medical schools are declining because the educational system "directs" them elsewhere. African-American men are victims of societal reality in that the threatening perception of African-American men and their perceived lack of contribution to society lead to incarceration and separation in unconscious hopes of "correcting" societal problems. African-American males are neither cared for nor nurtured through the educational pipeline. However, like all students, African-American men need someone to believe in them. Contrary to current belief, instead of getting rid of the problem, we make it worse.

I believe that the notion that we can increase the percentage of African-American medical students, and in particular African-American male medical students, simply by altering admission practices of colleges and graduate schools is shortsighted. If we are to see change, whites, African-Americans, and other minorities must acknowledge the interrelated problems that create the present situation. Solutions to these problems will require an exchange of dialogue, critical thinking, and

problem-solving by teachers, administrators, church, and civic leaders—and especially by young African-American males.

It is shortsighted for college and medical school admission boards or large institutions seeking more African-American male students to expect any rapid change, given the small pool of qualified applicants. I argue that the African-American male is not expected to succeed because of society's blatant negative perceptions of him. African-American men are neither nurtured nor encouraged to achieve academically. Relegating African-American male students to special education classes, expelling them from school early in the education process, placing them in jail, on parole, or on probation in disproportionate numbers will not lead to more African-American male doctors. Institutions that sincerely want to follow the initiatives of the AAMC and DCMP should assume responsibility for the dismal representation of African-American men in medical school, on house staff, and on medical school faculties, and address these issues. Until then we cannot realistically expect a significant rise in the number of African-American male physicians. □

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Saving Sergeant Buske

An Account of Remarkable Valor and Amazing Survival from the Records of the 65th General Hospital, a Duke University Army Reserve Unit of World War II

Ivan W. Brown, Jr. MD

In the hours before dawn on December 20, 1943, it was bitter cold at the US 8th Air Force base at Molesworth, England. The crew of a B-17 bomber named *Jersey Bounce* hardly needed the 4 a.m. wake-up call of the Charge of Quarters. Like most bomber crews anticipating the next day's mission over enemy territory, their sleep was easily interrupted. The sound of the CO's Jeep pulling up to their tar-papered hut had already awakened them.

Twenty-two year old Sgt. George W. Buske, a tailgunner from Rochester, NY, had perhaps more reason to be apprehensive than the others. Just five months earlier, a 20mm exploding shell fired by an attacking German fighter plane had caused deep wounds to his left hip. For that mission he had been awarded his first Purple Heart, another Oak Leaf Cluster for his Air Medal, and the Silver Star for conspicuous bravery. After 45 days in the hospital, he had finally returned to full duty.

Now, after a breakfast of fresh eggs at the mess hut—a treat compared to the powdered variety served on non-mission days—he and his crewmates, including radio operator T/Sgt. Forrest L. Vosler from Livonia, NY, went to the pre-mission briefing. Their day's mission was to be a return bombing raid on Bremen, Germany. They had flown to Bremen twice earlier that week. On those raids, their 303rd Bomb Group had encountered only moderate anti-aircraft fire, a few German fighter planes, and lost no bombers. Little did they realize how different the forthcoming mission would be.

Just after dawn, the *Jersey Bounce*, with Capt. Merle R.

Hungerford, Jr., from El Paso, TX, at the controls, took off with its heavy bomb load. Their group's slow circling climb to altitude and rendezvous with other bomb groups took nearly two hours. It was after 10 a.m. when the stream of more than 500 bombers left British air space for Germany. Approaching the Dutch coast, they encountered the first of their unexpected problems: a strong head wind, which caused some planes to reach the target off course and a half-hour late. At 26,000 feet, the assigned bombing altitude, the air temperature was below -50° F. Heavy condensation trails left by the bomber engines spread like white clouds in which large numbers of German fighter planes could hide to launch their attacks unseen. And unlike their last Bremen visit, there was intense and accurate anti-aircraft fire as they approached the target.

Suddenly, an anti-aircraft shell burst knocked out the *Jersey Bounce's* No. 1 engine. Moments later, just after the bombardier called out "bombs away," another shell knocked out the No. 4 engine, leaving its propeller, which could not be feathered, windmilling out of control. On only two engines and losing altitude and speed, the crippled *Jersey Bounce* fell out of formation. It was a sitting duck and German fighters lined up to shoot it down.

Capt. Hungerford and his copilot struggled to maintain altitude and keep the plane on course for home. The waist, turret, and tailgunners kept up defensive fire to ward off the fighter attacks. Their 50-caliber guns knocked down four German fighters, but others followed them out over the North Sea with relentless attacks, firing machine gun bullets and exploding 20mm shells into the stricken plane. One shell sent fragments into the legs and feet of T/Sgt. Vosler. Then a machine gun bullet passed completely through the upper abdomen of Sgt. Buske. Almost simultaneously, a 20mm shell exploding inches in front of his waist, blew his chest and abdomen open and propelled him backward from his tailgunner's seat into the fuselage.

The fighters continued to attack. The wounded Vosler,

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attempting to take over the now unmanned tailgun, was struck in the chest, face, and both eyes by fragments from another 20mm shell. With blood streaming from his eyes and able to see only blurred shapes, Vosler and the other gunners kept firing until the German fighters, convinced their prey was about to crash into the sea, broke off and turned back toward Germany.

By this time, the *Jersey Bounce* was just above the waves and fast running out of fuel. Vosler, though unable to see, repaired the damaged radio by touch and began sending out distress messages. Other crew members, attempting to keep the plane airborne, threw out everything they could to lighten the load. The wounded Vosler, barely conscious and feeling he was of no further use, begged to be thrown out himself to further reduce weight.

Out of gas but within sight of the East Anglian coast the *Jersey Bounce* finally crashed into the frigid North Sea. Vosler managed to crawl out unassisted onto a wing. Other crew members dragged out the severely wounded and unconscious Buske. Then Vosler, holding onto the plane's antenna with one hand and Buske with the other, kept the two of them from slipping underwater until they could be pulled into inflated dinghies.

Fortunately, their crash had been spotted by a Norwegian coaster, which picked them up and transferred them to a fast E-boat of the British Sea Rescue Command. Within an hour, they were inside Great Yarmouth harbor. From there, Vosler was sent to a Northhampton hospital and later to the States for a long hospitalization. One of his eyes had to be removed, and the other required extensive surgery but partial sight was restored. Sgt. Buske, barely alive and in profound shock from blood loss and exposure, was rushed to the local Great Yarmouth Hospital. After several blood transfusions and treatment for shock and hypothermia, he underwent emergency surgery.

There was a large, sucking wound of his right anterior chest, which exposed his right lung and continued through a disrupted diaphragm as a single gaping wound into the right upper abdomen. There were bleeding tears in his partially fractured liver, a laceration of the duodenum, and contused intestine. A second diagonal wound across the left anterior chest exposed a number of ribs. X-rays showed a number of shell fragments in his right thigh, abdominal wall, and both lungs. There were one or two fragments close to the heart. The machine gun bullet that had passed through his upper abdomen was lodged deep in the muscles of his back. Because of his extremely critical condition, the British surgeons could only control the bleeding from his torn liver, reattach the disrupted diaphragm, and close the sucking wound of the right



Fig 1: An emaciated Sgt. Buske in mid-March 1944. Still critically ill from his extensive wounds, he was visited at the 65th General Hospital near Botesdale, England, by Major General Norman T. Kirk, Surgeon General of the US Army.



Fig 2: After six months as a patient in the 65th General Hospital in England, Sgt. Buske is shown leaving by stretcher on June 16, 1944, for air evacuation back to the US for further treatment. The author, one of his attending surgeons, appears at right.

chest. The left chest wound was dusted with sulfanilamide and packed open. The large abdominal wound was packed with gauze and also left open.

With further transfusions and intensive nursing care during the next few days, his condition, though still critical, stabilized enough to permit transfer to the nearest US Army hospital; the 231st Station hospital at Botesdale, Suffolk. In the operating room there, the abdominal wound was found to be grossly infected and to contain considerable dead tissue. It was draining a foul, bile-stained fluid containing digestive juices and bubbles of intestinal gas. The wound was debrided and an area of pus over the dome of the liver was drained. An empyema of his right chest cavity was drained of a large amount of infected, bloody fluid. A few days later, an empyema of his left chest was drained as well.

He was unable to take fluids or food by mouth because of the total drainage of upper intestinal contents, which were slowly digesting and enlarging the abdominal wound. He was sustained entirely on intravenous fluids containing glucose. In those World War II years, there were no amino acids or complete nutrient fluids available for intravenous feeding. The only antibiotics were two early sulfa drugs and the newly discovered penicillin. These were wonder drugs against many wartime infections, but not against the types of bacteria causing Buske's infections.

The Long Road Home

When the US Army's 65th General Hospital—affiliated with Duke University—replaced the 231st station hospital at Botesdale in February 1944, Buske was on a downhill course because of malnutrition and the repeated complications of his formidable injuries. He developed a large abscess in his back, posterior to the abdominal cavity, and abscesses of his right thigh, abdominal wall, and left chest, all from the multiple shell fragments. All required surgical drainage. By mid-February 1944, he was largely unresponsive and his condition appeared terminal. There were long periods of Cheyne-Stokes respiration. Yet, his resilience and stamina in those critical days were remarkable. Often, as a nurse changed his position, he would arouse from his semicomatose state and exclaim "Damn it, can't anybody get any sleep around here?" then lapse back into coma.

His weight fell to 88 pounds (Fig. 1). In an attempt to improve his nutrition, and to provide a source of protein, daily units of reconstituted dried human plasma were added to his intravenous fluids. This proved successful in stemming his increasing emaciation, and improved the healing of his wounds.



Fig 3: President Franklin D. Roosevelt (seated at left) is about to present Buske's crewmate T./Sgt. Forrest L. Vosler with the Congressional Medal of Honor. The medal is being handed to the President by Undersecretary of War Robert I. Patterson. (Courtesy 8th Air Force Heritage Museum, Savannah, GA)



Fig 4: A healthy George W. Buske (left), with the author, 54 years after their wartime meeting. They stand in front of the home in Rochester, NY, that Buske built himself.

We later found that many of these wartime dried plasma units contained the hepatitis B virus, which caused a delayed, serious, and sometimes fatal hepatitis. Fortunately, in spite of receiving over 100 units, Buske escaped this complication.

Finally in March, three months after he was wounded, the gradually decreasing drainage from his large abdominal fistula allowed him to retain some fluids and nutrients taken by mouth. His nutrition was further improved by eggnog made with fresh eggs—a rare commodity in wartime Britain—brought to him by the vicar of the local Anglican church. His abdominal and lower chest wounds gradually healed. In May, he underwent further operations to close his wounds, including skin grafts to cover the still unhealed wounds of his right thigh.

By mid-June 1944, he was strong enough to be evacuated by plane back to the states for further treatment (Fig. 2). The 65th General Hospital surgeons who treated him marveled at his recovery up to that point, but we feared that his multiple severe injuries would lead to future medical problems, even limit his lifespan. He arrived in the US on June 24, 1944, and was immediately admitted to the Army's Halloran General Hospital on Staten Island. He stayed there for four months of further convalescence and rehabilitation. Then, after a three-week furlough home in November 1944, he requested, and amazingly enough, was returned to active duty at Langley Field, Virginia. He was not discharged from the Air Force until September 3, 1945.

History Retold

For his gallantry and valor above and beyond the call of duty on their fateful mission to Bremen, T/Sgt. Forrest L. Vosler was given America's highest award, the Congressional Medal of Honor. President Franklin D. Roosevelt presented the medal to him at the White House (Fig. 3). He was one of only three enlisted men of the 8th Air Force during World War II to receive this honor. Vosler died of a heart attack in 1992, at age 69, in Titusville, FL.

For 30 years after his discharge from the Air Force, Buske was employed as a yard foreman at a lumber company. He retired in 1978. Since the war, he has had two physical reminders of his near-fatal 1943 wounds. In 1952, he developed abdominal pain and fever that led to the surgical removal of shell fragments and the machine gun bullet. In 1988, he underwent successful coronary artery bypass surgery. Afterward, his cardiac surgeon presented him with a souvenir of the operation: an encrusted shell fragment the surgeon had found near his heart.

George W. Buske (Fig. 4), and Eleanor, his wife of 45 years, still live happily in Rochester, NY. They take great pleasure in their family, including their four grandchildren. In spite of all the past odds against his recovery and survival, this remarkable, twice wounded, and highly decorated Air Force veteran, now 78, continues to enjoy good health. □

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Rural Eastern Carolina Health (REACH)

A Model Community Health Improvement Program

Doyle M. Cummings, PharmD, Lauren Whetstone, PhD, David White, EdD, Catherine Nelson, MPA, Jo Morgan, MA, Diane Poole, MSN, RN, and John Morrow, MD, MPH

As managed care develops in North Carolina, reimbursement for health-related services will move from a discounted fee-for-service scheme to more sophisticated models of payment by capitation. Physicians and other health care providers will become responsible for care of a population of people known as "covered lives," rather than just individual patients. Since positive changes in the health status and health behaviors of the covered population can lessen the use of expensive health care services, primary care physicians will want to encourage such changes in both individuals and the community. When physicians and other health professionals work together with local citizens, schools, government, faith communities, and health and human service agencies, they can significantly impact the assessment and planning of local health initiatives. This paper provides an overview of how one such process has been successfully implemented in four counties in eastern North Carolina.

The Scope of the Problem

Eastern North Carolina is a rural, poor, and medically underserved region. The 29 counties that make up Health Service Area VI have a population of approximately 1.2 million people, over one-third of which is nonwhite. The elderly population is substantial and growing. Nearly 20% of the people live below the federal poverty level, compared to 14.5% nationally. In a number of counties, as many as one in five individuals has no health insurance. Mortality rates for most chronic diseases are above state averages, and the high rates of sexually transmitted diseases, substance abuse, and teenage pregnancy remain major health challenges.

These problems are multifactorial in origin, but strongly associated with the socioeconomic status and culture. In fact, social and cultural factors have a greater effect on health than the rate of utilization of the medical care system.¹ Moreover, there is evidence that even significant changes in the health care delivery system cannot fully solve broad-based health problems.² Just look at the many situations in which personal behaviors (poor diet, lack of regular exercise, promiscuous sex, substance abuse) produce excess morbidity and mortality. These observations mean we need to broaden our definition of health, as the Institute of Medicine recently proposed.¹

Access to medical and preventive care remains elusive for many, but physicians have provided leadership in bringing about positive changes in this state.³ Still, changing the perception of health problems and health behaviors at the community level is a tough task. Local citizens are often reluctant to change unless they are significantly involved in the process of change. Ownership of the process by local citizens is a crucial step, and it can be facilitated by physicians and other health care professionals.

The Climate for Collective Action

The process of community health intervention began in 1995 when East Carolina University (ECU) School of Medicine, Pitt County Memorial Hospital (now University Health Systems of Eastern Carolina), and the Eastern Area Health Education Center (EAHEC) each reviewed and expanded their involvement in the surrounding region. The hospital wanted to build a regional health care delivery system. The School of Medicine and EAHEC wanted to move student and resident learners away

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from the academic campus into community practices, and so they began the Rural Residency Program and the Interdisciplinary Rural Health Training Program.

The mission statements of the medical school and the hospital reflect their commitment to improving the health of the citizens of the region, a mission shared by local health departments. Because of the rural nature of the region, medical care is delivered predominantly in small- to moderate-sized communities with varying degrees of a health care workforce and infrastructure. This means the delivery of health care was, and in many places continues to be, very fragile. The looming prospect of a capitated health insurance system led to a growing realization of the need to invest in the care of populations rather than just individual patients. In addition, community members wanted a stronger voice in changing health care delivery. These factors set the stage for effective collaboration. Key individuals in the hospital, the School of Medicine, and the Public Health Department fashioned a common vision of how this could be done. They were assisted in their undertaking by the generous financial support of the Duke Endowment and University Health Systems of Eastern Carolina, as well as in-kind support from all involved institutions. Together they enabled partnership development and comprehensive needs assessment.

Building Partnerships

A steering committee was formed, with representatives from all involved counties. The initial step in community health intervention was the committee's decision that an inclusive partnership or coalition was the best approach to defining, prioritizing, and correcting community-level health problems. The hospitals and health departments of four eastern North Carolina counties (Pitt, Martin, Hertford, and Duplin) served as the backbone of the partnership. They also formed an executive council to oversee the regional development of the project, which was reviewed and supported by the local medical society.

Hospital and health department staff identified potential partnership members from each of the entities listed in Table 1, below. Community members without any affiliation to an agency were identified and recruited to serve from small communities in each county. Orientation meetings were facilitated by faculty and staff from ECU and University Health Systems of Eastern Carolina. A mission statement was developed to address the compelling health concerns of each county, and a chair was elected from within each county group to provide local leadership.

Partnership selection of health concerns. In order to address the most compelling health concerns of local citizens, partnership members in each county selected

what they considered to be the top five of the health domains developed by the *Healthy Carolinians 2000* program of the North Carolina Department of Health and Human Services. Faculty from the ECU School of Medicine identified available information pertinent to these issues from a variety of state and local sources, and presented this information to partnership members for review. Representatives of existing service programs pertinent to the prioritized domains shared their program activities with the partnership. This ensured that partnership members had similar levels of understanding about each domain. The process was completed over the course of several meetings.

The survey process. Existing data did not sufficiently characterize the health problems of the prioritized health domains. Consequently, each partnership worked in concert with ECU medical school faculty to survey each county.⁴ The initial step was to define the needed information which, once collected and combined with existing data, would provide a composite picture of local health problems and effectively inform local health planning. The information objectives were agreed on by the partnership, which developed a questionnaire addressing demographics, local health service utilization patterns, and personal health behaviors. Trained interviewers carried out the survey in two stages: an enumeration stage to collect demographic data from 5000 randomly selected households, and a second, longer interview of 2500 randomly selected households to collect needed health information. In addition, the Youth Risk Behavior Survey, developed by the Centers for Disease Control and Prevention, was administered to all 7064 middle school students in the region to assess the health risks of adolescents. ECU faculty and staff compiled and analyzed data from both surveys.

The survey data, summarized here but to be developed in greater detail in separate publications, revealed a consistent pattern linking health care to socioeconomic status. Individuals with no health insurance and with less education had more difficulty accessing needed health care and preventive health services, and depended more on the emergency room as a source of care compared to those with health insurance and more education. There was a high level of satisfaction with the quality of care received from physicians with the exception of long waiting times for office visits and the lack of readily available night and weekend care when needed. The self-reported prevalence of chronic diseases such as diabetes and hypertension was higher than state averages, in part because of

Table 1. Key participants represented in each county partnership

| | | |
|--------------------------|-------------------------|-------------------------|
| Hospitals | Health care providers | Civic groups/United Way |
| Health departments | Multiple citizens | Chambers of commerce |
| Dept. of Social Services | City/county governments | Major employers |
| Cooperative extension | Senior citizens groups | Mental health agencies |
| School systems | Faith communities | Police, fire, rescue |

the age and race distributions in the four counties. Personal health habits of concern included frequent tobacco use, poor dietary patterns, and lack of exercise. The survey of middle school students revealed early experimentation with tobacco, alcohol, and substances of abuse, poor dietary patterns, lack of exercise, a high prevalence of obesity (particularly among African-American girls), and a significant risk for depression and suicide. These data were reviewed with the local medical society and the hospital medical staff for validation.

Prioritization of health problems. Survey data were reviewed by each county partnership. Partners were pleased to hear information that was specific to their county, and were surprised by a number of the findings, especially those of the Youth Risk Behavior Survey. Once the data were reviewed and questions answered, "report cards" summarizing the strengths and weaknesses identified in each county were provided to each partnership, which then selected (by voting) the three most compelling health problems identified. Two counties chose barriers to needed health care as a priority. All four partnerships selected substance abuse and chronic diseases such as diabetes and hypertension. Two partnerships focused on poor nutritional patterns and lack of nutrition education, and one on mental health and suicide.

In some instances, it was obvious that data presented early in the process had identified a significant problem, and action was initiated by partnership members while the community survey was under way. An example of this was the problem of childhood asthma and the frequent use of the emergency room. Overuse of the emergency room for asthma attacks was substantially reduced by an action plan that brought clinical nurse specialists and respiratory therapists into the school system for student and parent education as well as teacher training.

Development and implementation of action plans. Once priority health problems were selected, partnerships in each county divided into working groups to focus on each problem and develop an action plan for that priority area. The action plans included the following: a goal statement; specific, measurable objectives; a timeline; and a list of individuals responsible for each action step. The subgroups then entered their activities on a common timeline for review by the entire partnership. Each working group also completed an "assets map," defining existing resources that could be incorporated into the work. Each group was encouraged to consider what resources might already be available in the county and could be applied to the

problem at hand, although the potential for outside support was not ruled out. At present, subgroups are in the process of implementing their respective action plans.

Evaluation and Conclusion

The model of community health improvement presented here has brought together individuals from the community and from a variety of health and social service agencies to sit at the same table and work on common problems. In some counties, this was the first effort at organizational and community collaboration, and it was well received. The process enabled the ECU School of Medicine and the University Health System of Eastern Carolina, as flagship health institutions in eastern NC, to be deeply involved in planning for the community and region, in keeping with their mission of improving the health of local and regional citizens. It is significant that the involvement of these institutions was not limited to fiscal support. Rather, they and the local health departments and community hospitals invested the human capital necessary to lead this comprehensive process of community health improvement. Finally, the collaboration has provided the community with a voice for its health concerns, and has led to the development of a series of action plans for problems identified and prioritized by the community. These will be implemented during the coming year. Physicians have served important roles throughout this process, participating side by side with community members.

The primary goal of our efforts is healthier communities. We can accomplish this by aggressive collaboration and leveraging of community resources. Each action plan has defined outcome measures, but it is imperative that each community define how it will measure changes in health behaviors or improvements in access. These are the things that will lead to improved health status and better use of community resources. Physicians and other health professionals have and will continue to provide valuable leadership in this, and help engender the broad-based cooperation necessary to promote optimal health outcomes. □

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STAFF PSYCHIATRIST

(PHYSICIAN III-B)

SALARY: \$91,906 - \$152,862

LOCATION: Adult Mental Health Services Unit

NUMBER OF VACANCIES: 1

DATE POSTED: November 30, 1998

**CLOSING DATE FOR
RECEIPT OF APPLICATIONS:** January 31, 1999

DESCRIPTION OF WORK: The individual serves as Staff Psychiatrist in our Adult Unit. Duties include assessment and diagnosis of psychiatric/substance abuse and physical disorders when present, providing treatment or referral for such disorders and timely and accurately documenting such events. Participation in On-Call schedule, medical staff organization and its activities; availability to provide psychiatric coverage to other units or programs as needed; and provision of clinical oversight on assigned unit.

MINIMUM REQUIREMENTS: Graduation from an accredited School of Medicine with an MD or its equivalent and completion of Psychiatric residency and one year of experience in the practice of Psychiatry.

SPECIAL CONDITIONS: Eligible for licensure to practice medicine in North Carolina. Board Certification required. Prefer experience with dually diagnosed (MI/SA) or Substance Abuse.

APPLICATION PROCESS: An original CenterPoint Human Services application is required (resumés are not accepted in lieu of a completed application form). If a degree is required for the position applied, a copy of transcripts must be submitted with application form. If an offer of employment is extended, official college transcripts must be submitted prior to beginning work. An application may be obtained from the Center and submitted by the closing date to:

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A Survey of Beliefs About Managed Care

Traci Dreher, BA, and Kathryn Whetten-Goldstein, PhD

Managed care is becoming ever more prevalent in North Carolina. This makes it important to understand and to quantify how health care providers (physicians and nurse case managers) perceive managed care, and so we studied how care providers and patients might react to a hypothetical managed care environment in North Carolina. We were particularly interested in cases involving HIV-positive patients on Medicaid because the high costs of care make HIV-infected patients particularly vulnerable to managed care protocols. Currently, 55%-70% of persons with HIV and AIDS in North Carolina are eligible for Medicaid, and Medicaid programs throughout the US are moving increasingly toward managed care.¹ This makes the opinions, thoughts, and perceptions of health care providers and HIV patients relevant to public and personal health policy. We therefore asked a small sample of North Carolina physicians and case managers how they perceived managed care, how it might influence decisions to remain in (or leave) practice, and how it might influence the number of HIV patients a provider will treat.

HIV/AIDS in North Carolina

The number of new HIV and AIDS cases has risen dramatically in the South within the past 10 years. As the numbers grow, it is apparent that there is a "second wave" of HIV that does not follow the previous pattern (which predominantly affected homosexual men in metropolitan cities on the East and West coasts). The new wave affects rural, heterosexual, nonwhite, female, young, and poor individuals,² and the two primary modes of transmission are injection drug use and heterosexual contact.³ Incidence rates for HIV and AIDS have remained

fairly constant for five years, but prevalence rates have increased due to the use of new life-extending therapies⁴ and the migration of HIV-positive individuals from outside North Carolina into rural areas of the state.² Because infected individuals have complex medical and social service needs, managed care may provide incentives for medical and social service collaboration.

Methods

We surveyed providers about their practice pattern characteristics, perceptions of managed care, factors influencing their decision to stay or leave practice, and factors influencing the number and type of patients they treat in a year. We asked them to rate how well their formal training prepared them to practice preventive care, to manage the "business" of practice, and to coordinate care with different agencies since these core competencies are seen as desirable by HMOs.⁵

In January 1998, 42 physicians were mailed a survey with an introductory letter and return envelope; 13 (31%) responded by mid-February. A second survey and letter were then sent to the 29 nonrespondents, followed by telephone calls when needed. The second mailing produced an additional nine responses, for a final response rate of 52%. Another four medical providers, not included in the initial mailing, completed surveys at an HIV-related medical training session. The survey was also distributed to 10 case managers who work with HIV/AIDS clients. The sampled physicians and case managers had previously indicated an interest in learning more about HIV and AIDS during a separate survey; these individuals represent those who would be affected by a managed program for HIV/AIDS patients. The 36 responses were combined in order to better interpret service providers' opinions of managed care. Due to incomplete data, some analytical models have sample sizes less than 36.

Providers were asked to rate their freedom to practice under managed care and the outcomes of managed care using a five-point Likert scale. The questions were adapted from a survey developed by Joel Cantor, PhD, or from general ideas of managed care. We asked how providers would respond to a

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managed care format for Medicaid, such as whether or not a provider would exclude Medicaid patients, restrict office hours, or consider leaving the medical profession entirely. (A copy of the survey is available on request from the authors.)

Both exogenous and endogenous factors might affect the analysis of our data. Exogenous factors (medical practice outside of North Carolina, total years of practice, medical and case management training, and geography) were quantified and included in the analysis. Endogenous factors (number of HIV/AIDS patients served, percentage of Medicaid patients served, and type of medical practice) were also quantified and summarized in the analysis because of their potential influence on explanatory (regression) models.

Descriptive statistics and regression models were calculated for several questions in the survey using Microsoft Excel 5.0 software and JMP In 3.0 software. Three regression models (one logistic and two multiple regressions) were used to examine factors that might be important in describing providers' behaviors toward patients with HIV in a managed care setting.

In order to understand what influences a provider's perception of managed care, we asked respondents to use five-point Likert Scales (ranging from 1 ["strongly agree"] to 5 ["strongly disagree"]) to respond to three positively phrased statements about managed care. We then created an ordinary least squares (OLS) regression model containing four variables: the type of community (rural or urban) in which the provider worked; the type of practice (generalist or specialist); number of patients the provider treated per week; and the months that the provider had been in practice. The dependent variable—perception of managed care—was the sum of the responses to the three Likert scales (the summed responses therefore ranged from 3 to 15; higher scores indicated greater disagreement with the positive statements).

How managed care impacts providers may be reflected in a stated intention to leave practice should managed care become dominant. To assess willingness to stay in or leave practice, we used a logistic regression model incorporating five factors: 1) the current degree of competition in the respondent's practice, 2) the respondent's formal training in business aspects of practice, 3) the respondent's formal training in providing cost-effective care, 4) the length of time (in months) that the respondent had been in practice, and 5) the respondent's response to a positive statement about managed care. Respondents rated the competitiveness of their present practice as "very competitive," "somewhat competitive," or "not at all competitive." Their responses to training questions were condensed to binary values (either good-to-excellent training or fair-to-poor training).

A multivariate regression model based on several factors was used to predict the number of HIV/AIDS patients that would be treated by a provider in one year. Five factors were selected: 1) the total number of patients seen by the respondent per week, 2) formal training of the respondent in HIV/AIDS medicine, 3) number of months the provider had been in practice, 4) percentage of practice revenue from Medicaid, and

5) type of community in which the respondent practiced.

Results

Descriptive results from the survey. Most of our respondents thought that managed care would limit freedom, restrict physician autonomy, and deliver worse care. They held these opinions even though 70% of them already had a contract with or provided care through a health maintenance organization.

When asked about patients' insurance status, physicians responded that 24% of their patients had no health insurance. Sixteen of 23 physicians (70%) accepted Medicaid patients and received, on average, 25% of their revenue from Medicaid. Those who had a contract with an HMO derived an average of 16% of their revenue from this source. Medical providers had followed an average of 30 HIV/AIDS patients over the past year.

Most respondents felt they had been poorly prepared for important aspects of managed care (Table 1, next page), the one exception being that they felt well prepared to work effectively with other physicians, physician assistants, nurses, and case managers. When asked how well their medical training had prepared them to care for HIV/AIDS patients, 62% said "fair or poor" in keeping abreast of new treatment developments, and 89% said "poor" in keeping abreast of new developments in social services for patients with HIV/AIDS.

One salient point illustrated by the data was that 55% of specialists practiced in urban regions and 45% in rural regions. The trend was reversed for case managers; 90% described their practice community as rural yet only 10% said it was urban.

Perception of managed care from the regression model. As Table 2 shows, next page, the variables that best explained providers' perceptions of managed care were the number of months in practice and the community in which the practice was located. Providers who had been in practice for many years were significantly more likely to have unfavorable perceptions of, or disagree with positive statements about, managed care. Providers in urban communities were significantly more likely to disagree with positive statements about managed care than those in rural areas. Type of practice and number of patients treated per week were not significant ($p>0.05$).

Providers' responses to managed care. Perceived competitiveness did not significantly describe a provider's likelihood of leaving practice because of managed care (Table 3, next page). In fact, providers who planned to leave their practice were more likely to describe their current environment as "not at all competitive" (in 31% of cases) than as "very competitive" (15%), and providers who planned to stay in their practice under managed care were more likely to say their current situation was "very competitive" (17%) than "not at all competitive" (8%).

Neither training in business aspects of practice nor training in providing cost-effective care were significantly related to

Table 1. Responses of 26 providers to medical practice patterns survey

| Providers' perceptions | Agree | Neutral | Disagree | |
|---|------------------|----------------|-----------------|-------------|
| Managed care limits the amount of care to patients | 94% | 6% | 0% | |
| Managed care encourages preventive medicine and services | 33% | 31% | 36% | |
| With managed care, more people can access health services | 17% | 31% | 52% | |
| Under managed care, a physician's freedom to practice is disrupted | 86% | 11% | 3% | |
| Managed care will decrease my opportunity to refer for consultation and consult on patients | 75% | 22% | 3% | |
| Managed care will improve the quality of care that I can offer to patients | 6% | 22% | 72% | |
| How did formal training prepare you: | Excellent | Good | Fair | Poor |
| to manage the business aspects of your job? | 3% | 14% | 22% | 61% |
| to provide cost-effective medical care? | 14% | 31% | 41% | 14% |
| to provide preventive care? | 23% | 50% | 15% | 12% |
| to coordinate patient care with community services and resources? | 3% | 25% | 36% | 36% |
| to work effectively with other physicians, physician assistants, and nurses? | 44% | 47% | 6% | 3% |

providers' intentions to leave or to stay in practice. Providers who said their business training was "fair or poor" were slightly more likely to leave (55%) than to stay in practice (45%) but the difference was not significant. However, since only three respondents described their business training as good, any extrapolations from these data would be weak. Likewise, neither months in practice nor training in the provision of cost-effective care explained the responses of providers. Those who rated their training as fair or poor (50%) were just as likely to remain in practice as those who rated their training as good or excellent (50%). Only one variable was statistically significant: provider response to a positive statement about managed care. Providers who agreed with the positive statements about managed care were less likely to leave their practice (100% stay, 0% leave). Strangely, even those who disagreed with the positive statements were unlikely to leave practice (67% stay, 33% leave), but those who were neutral about managed care were more likely to leave the practice (75%) than to stay (25%).

Table 2. Regression: perception of managed care by 26 medical providers

| Independent variable | Coefficient (standard error) |
|---|-------------------------------------|
| Intercept | 8.972 (0.664) |
| Months of practice | 0.011* (0.004) |
| Type of practice (0=generalist, 1=specialist) | -0.183 (0.334) |
| Community (1=rural, 2=urban) | 0.579† (0.329) |
| Number of patients per week | 0.004 (0.006) |

* = significant at 99% level

† = significant at 90% level

Table 3. Logistic regression: decision to leave practice due to managed care

| Independent variable | Chi square of likelihood ratio (p>chi square) |
|---|---|
| Response to positive question | 5.845* (0.054) |
| Training for business aspects of job | 0.482 (0.488) |
| Training to provide cost-effective practice | 0.071 (0.789) |
| Current competitive nature of practice | 2.138 (0.343) |

Coefficient (standard error)

| | |
|--------------------|---------------|
| Months of practice | 0.009 (0.006) |
|--------------------|---------------|

* = significant at the 95% level

Number of HIV patients seen by a provider. No explanatory variables were significant in the regression analysis of the

number of HIV positive patients seen by a provider.

Discussion

This study should be looked at as a learning tool and as an

indicator of areas in which education and conversation about managed care might positively impact managed care in North Carolina. We can expect that managed care in some form will spread throughout the state; physicians and patients must learn to understand and work with it.⁶ Managed care is most successful when physicians take an active role in creating the new system, so providers, particularly those who have been practicing for many years, should embrace education about managed care and HIV services.

Since perception of managed care was the only factor in our survey that significantly determined whether providers said they would leave or stay in their practice, it is important that providers engage in meaningful and honest conversation about managed care in North Carolina. If education improves providers' perceptions of managed care, then all participants in the health system would benefit.

Our study focused on providers who treat patients with HIV/AIDS and providers who are interested in HIV/AIDS issues. Our analysis does not indicate what predicts the number of HIV patients seen by a provider, but we now better understand how providers feel their formal training prepared them to stay abreast of HIV services. The quality of care for HIV-positive patients in managed care settings could be improved if providers were more educated about the disease and if all facets of the health care community worked together.

We indirectly looked out how physicians may, or may not, be satisfied with managed care in the future. The responses to our questionnaire offer two interesting insights:

1) Length of time elapsed since completion of medical training may influence providers' responses to our questions about how well their training has kept them abreast of new developments in HIV treatment. Providers who had practiced longer said that their formal training poorly equipped them to grasp new HIV treatment developments. Providers who were more recently educated indicated that their formal training had prepared them for this. This finding is congruent with a recent survey of first year medical students at the University of New Mexico and the University of Chicago; 92% of the students said they would "welcome" HIV-positive individuals into their practices.⁷ It appears that increased attention to HIV/AIDS in medical schools has already, and may continue to, influence future medical providers' comfort in treating patients with the disease.

2) Our observations suggest a bias toward urban areas for specialists and rural areas for case managers in North Carolina. Each is integral to the well-being of HIV-positive individuals, but geographical distance must not prohibit medical specialists and case managers from providing high quality of care. The geographical bias is a valuable sign that case managers and physicians must work together to provide complete and comprehensive care to persons with HIV and AIDS in rural settings.

The primary limitation of our study is its small sample size and low response rate. However, the results offer an interesting first glimpse at attitudes toward managed care in a state that has experienced relatively low managed care penetration to date,

but will likely see an increase in the years to come. A survey conducted on a larger scale in the future might allow us to gather more baseline data and evaluate the impact of coming changes in practice. □

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Thoughtful Death in 1999

Edward V. Spudis, MD

Euthanasia

The challenges of providing conscientious care to terminally ill patients have increased rapidly. The semantics surrounding the issue are impressive, but we often find ourselves trying to distinguish the subtleties of "intentional," "nonvoluntary," "incidental," "indirect," "passive," and "physician-assisted" euthanasias. The word euthanasia itself, traditionally translated as a *good* death, leads to many problems. I offer these examples:

1) Physician-assisted suicide can be described as euthanasia with a definitive physician contribution that may purposefully hasten death. It can be difficult to distinguish from murder, and American medical societies have uniformly disapproved of the concept.

2) Voluntary passive euthanasia, in which the attending physician withholds medication or life support at the patient's request, is widely condoned. This clinical inactivity has been described as a "foregoing" (of treatment) or an "allowing" (of death to occur).

Relatives and nurses may question the subtle differences between nonvoluntary and passive euthanasia, between "personhood" and "humanness"; we see intriguing phrases on the chart such as, "...not to reanimate."¹ The distinctions employed often involve family physicians, geriatricians, and hospital-based doctors. The following thoughts may be useful while we watch for refinements from those ethicists who treat patients:

Physician-assisted suicide (PAS). This is a unique category of euthanasia. As populations age, we can expect a growing percentage of deaths from a variety of suicides. However, problems arise when patients or families request active physician assistance that could be confused with murder.² In PAS, the physician intends to relieve suffering by hastening death.^{3,4} Legal safeguards for physicians will not be standardized for years. Quill vigorously promotes the legal approval of PAS for

carefully screened, legally competent patients. However, his terminal treatment would be given only after repeated detailed requests from the patient.⁵ Advanced medical directives currently avoid the word suicide. What would constitute an explicit request and what anticipatory interval should be allowed?

Without legal approval of assisted-suicide, will secret collaborations with patients become more common? Angel believes that PAS should be available for patients too frail to carry out their own death wish.⁶ I agree that patients should not have to request Kevorkian-style methods, but we can surely anticipate an erosion of present standards if PAS becomes common practice in the United States. Hendin says there has been a 27% increase in PAS in the Netherlands in the past five years.⁷

Sixteen years ago, Callahan dramatically suggested that "denial of nutrition may become the only effective way to make certain that a large number of biologically tenacious patients actually die."⁸ The refusal of nutrition by a competent patient hoping to avoid pain and a loss of dignity may well become the most popular way to exit, regardless of whether it is labeled a variety of suicide or a subtype of euthanasia.^{9,10} Menken tentatively proposed that managed care could make it awkward for medical personnel to be involved in decisions that diminish extended or expensive care. PAS would, of course, almost always be the least expensive treatment.¹¹ The evolving regulatory language will be intricate because of costs, religious dogmas, and medical specialty organizations.¹²

It may become common in other countries to offer assistance to those wishing to commit suicide, but I think it unlikely that American physicians and health workers will quickly endorse the process. The AMA and 44 other American medical societies have opposed physician-assisted suicide as defined. Will it become risky to decline participation in a patient's suicidal effort? It seems unlikely that a physician would be convicted for declining to participate.¹³

After a hundred years of debate, there are still conflicting opinions about whether euthanasia is ever appropriate and how it is to be defined.¹⁴ Emanuel defined two categories, each with three potential subgroups.¹⁵ What follows is a simplified version.

Dr. Spudis is a Neurologist, Forsyth Medical Center, and an Emeritus Clinical Professor, Wake Forest University School of Medicine, Winston-Salem.

1. *Active and intentional euthanasia.* Here the physician's action is the deliberate, active, and sufficient cause of death. Such action may come at the patient's explicit request, without the patient's request, or when the patient is unable to make a request.

2. *Nonintentional euthanasia.* Here the attending physician is a documented contributor, but the contribution is not sufficient to cause death. Withholding nutrition or medications may allow an earlier death, or the use of medications may cause an "incidental" death, or a convenient means might be supplied when the patient's intentions are obvious.

The nuanced distinction between intentional and nonintentional varieties seriously challenges semanticists. Would tapering fluids over 10 days lead to an incidental death? Thoughts of suicide in an 80-year-old patient would surely be considered differently if they came from a teenager. Deaths that result from patient refusals of treatment may become common, even routine, and it is likely that these will be accepted as reasonable. But we will need Nobel-quality strides in psychiatry before reaching a standardized treatment-withdrawal protocol for euthanasia in chronically psychotic or demented patients. We need a socially acceptable alternate label for this voluntary passive euthanasia category.

There are many dissenters. Brock states that euthanasias, being the deliberate killing of an innocent person are "...nearly always impermissible."¹⁶ Goldblatt, who has treated hundreds of patients with amyotrophic lateral sclerosis, writes that "active euthanasia, voluntary or not, is currently a crime."¹⁷ Compare this to Grant's simplistic justification of treatment withdrawals: "Futile treatments should never be started or allowed to continue, in any case."¹⁸ A Washington state ruling declared that a dying person's right to liberty includes a right to "assistance in ending life," and the Ninth Circuit court in California bluntly stated that a terminally ill person has the right to lethal medication. When patients or families broach the subject of euthanasia it would be prudent to help them choose the clinical phrases that might mediate their decisions.

Brain Death

As our ability to compartmentalize syndromes of brain damage becomes more reliable, euthanasia guidelines ought to become more acceptable. We do need carefully chosen words to reflect the ongoing efforts to identify secular sources of popular but ill-defined traits, such as humanness, personhood, and sapience.

Persistent vegetative states (PVS). During the past 26 years, this phrase has been used to describe a life "...devoid of intellectual and social intercourse."¹⁹ PVS typically includes cyclical sleeping, unpredictable smiling, chewing, and eye movements in the direction of a noise. Coma—often mislabeled PVS—is a temporarily unarousable state with no cyclical sleeping. Expensive investigations and careful support of PVS patients are justified for many months, especially in young

trauma patients who may recover. PVS is never an appropriate emergency room diagnosis. When PVS remains the best diagnosis after six to 12 months, the likelihood of improvement becomes trivial. Rapidly improving magnetic resonance and positron emission imaging, and electrically evoked cognitive responses should improve the accuracy of our long-term predictions.²⁰

About half of the legally-contested euthanasia cases in the US involve PVS or a minimally conscious state (MCS). MCS is a recent concept that encompasses crude movements and more responsiveness than PVS, but has no quantitative differential features. Since Sir Francis Crick suggests that we abandon the word "consciousness" in favor of "awareness," MCS may well be renamed. There will always be a definite, slight legal risk when withdrawing life support in vegetative patients (as in the 1990 Nancy Cruzan case), but there are now also significant legal risks from overtreating terminal patients. Who wants to die with indignity?

When to tell relatives that the whole brain is dead. Since not all parts of the brain are uniformly essential, "brain death" implies that the neocortex has been irreversibly damaged, even when specialized regions, such as the hypothalamus, still function. This, of course, increases the numbers of patients who may be called legally dead despite having billions of still functioning neurons. Academic definitions of whole brain death specify permanent cessation of all function including that of the brain stem. However, we only test brain function when the body temperature is above 90 degrees, and, paradoxically, the "dead" brain itself has a role in maintaining this temperature. Similarly, diabetes insipidus is usually not listed as a requirement of brain death; we must decide whether the pituitary is part of the brain.

Bedside determinations of brain death require considerable experience in interpreting the caloric stimulation of eye movements, and the measurement of blood gases during apnea testing. Neither is a reliable procedure if the examiner only does it once a year.²¹ A tiny percentage of patients exhibit random extremity movements from spinal reflex activity—the Lazarus sign—even though there is no viable neural tissue inside the skull. Traditional tests like the EEG, angiography, and ultrasonography are helpful, and positron emission techniques may soon be.²² The EEG has an unfair reputation for unreliability in deciding about brain death. Neurologists agree that patches of cortical electrical activity may persist when all other current testing methods indicate death. In a similar way, event-related auditory evoked responses may detect patients who are brain dead but still respond electrically to specified random beeps. This evidence is so disturbing to most families that many clinicians have abandoned the procedure.

In general, whole brain death should be easily distinguished from PVS, but aggressive consultants sometimes label their conservative brethren as putrefactionists.⁸ Decisions about death are especially critical when the patient is a potential organ donor. The family should be told that all evidence shows a dead brain, and that mechanical support is being continued while the

family considers permission to donate organs that may still be healthy. In the future, perhaps we will be able to say confidently that all radiological, electrical, and ultrasonic recordings of essential brain functions indicate death. Patients with severe brain deficits from neocortical damage will have permanently lost the important qualities I call humanness, although in 1999 we have only crude guidelines for calibrating humanness.

Do-not-resuscitate. Simplistic DNR orders actually authorize passive euthanasia. After decades of worldwide experience we are accumulating data to standardize the rules for initiating and ending resuscitations in hospitals.²³ A study of 1955 patients revealed that patients choosing to forego resuscitation had "...no difference in hospital survival."²⁴ Unfortunately, physicians ignore patients' written opinions concerning resuscitation much of the time.²⁵ When families ask that useless and unreasonable care be avoided, we need to help them define terms carefully. We never stop caring or terminate personal hygiene. If a family proposes a course that seems inappropriate, we

explain exactly what we are able to do that the patient might have wanted. Transfer to another team or another hospital is a last resort, but is seldom satisfactory.

Futile treatment. A verbally popular term, "futility" is too vague to be helpful. Of 200 patients who died in 1997-1998 in a 910-bed hospital, only one chart characterized further care as "futile." Severely incapacitated elderly patients sometimes strongly oppose all plans to taper treatment. Differences in perception between "nonbeneficial," "futile," and "extraordinary" care may lead to an impasse. When medical resources are scarce, rules become arbitrary. As the population of patients with PVS increases, we can expect more innovative and practical futility guidelines.²⁶

Death has traditionally been considered the logical, expected result of a uniquely personal incurable disease. Now, well-meaning physicians, patients, relatives, and clerics are all searching for better understanding and a proper role in our intricate, parcelized clinical care system. □

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Protecting the Fetus from In-Utero Cocaine Exposure

David N. Collier, PhD, MSII

In the United States, it is estimated that 5% to 7% of all expectant mothers use crack/cocaine during pregnancy,¹ with rates as high as 45% in poor urban populations.^{1,2} Others estimate that 91,500 to 240,000 infants are exposed to cocaine in utero annually.³ The potential risks to such a large number of fetuses, and the increased health care costs associated with such prevalent gestational cocaine abuse has generated support for punitive actions against, including incarceration of, cocaine users during gestation.

For example, a program that enjoyed broad public and political support was the Medical University of South Carolina's (MUSC) Interagency Policy of Management of Substance Abuse During Pregnancy (Interagency Policy).⁴ This policy, in effect from October 1989 to September 1994, required that some patients seen in the MUSC obstetrics clinic submit urine samples for screening for illegal substances if they met certain risk criteria.

Patients who tested positive for crack/cocaine or other illegal substances were subject to arrest if they failed to participate in substance abuse therapy and prenatal care programs. A second positive drug test resulted in immediate arrest following medical release. (For an excellent review of the Interagency Policy see Jos, Marshall, and Perlmutter.⁴)

When a physician reports the cocaine status of a pregnant patient to legal authorities, as was required by the Interagency Policy, he or she is obviously breaching physician/patient confidentiality. However, it is not so easy to determine if such a breach is ethically justified or not. The purpose of this essay is to examine some of the moral and ethical arguments that support such a breach.

When It's Okay to Breach Confidentiality

Reporting cocaine use in the gravid female is ethically justifiable. According to medical ethicists Beauchamp and Childress,⁵ a physician can justify breaches of physician/patient confidentiality if there is a significant probability of significant harm to the patient or (an) other person(s), especially if the individual(s) that will be harmed can be identified; or if there is a specifically mandated legal duty to do so (as in the case of child abuse).

In the case of maternal cocaine use, both the mother and the fetus could suffer harm. Reporting to protect the mother from herself, at the expense of her autonomy and her rights to liberty and freedom from bodily restraint, is overly paternalistic and is therefore unjustifiable.

However, because the fetus is a readily identifiable victim (see below) whose well being is at stake, one of the above conditions that justify a breach of confidentiality has been met. This is an especially powerful argument for neonatologists and pediatricians involved in prenatal care since their responsibility, or fiduciary relationship, is primarily to the fetus.

Since certain forms of abortion are legal in the US, it can be argued that the fetus, unlike the ex-utero infant, enjoys no protection from murder, abuse, or neglect. Such an argument erodes the concept that the fetus is a readily identifiable victim, since in this view the fetus is in effect, a nonentity. However, in the situations discussed here, the mothers intend to carry their fetuses to term. Although this may not change the legal status of the fetus, this intention certainly raises the moral and ethical considerations owed the fetus to those owed the neonate. Therefore, I conclude that a fetus that is expected to be carried to term (or some other "natural" outcome) is a readily identifiable victim.

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Determining the Extent of Harm

Perhaps the most controversial aspect of deciding whether it is ethically justifiable to breach confidentiality is determining what the probability of harm is, and what the extent of that harm may be. This is especially true in the case of cocaine use, since it is difficult to tease out the effects due strictly to cocaine abuse from the results of other legal behaviors known to harm the fetus, such as alcohol use/abuse, tobacco use/abuse, and poor nutrition. However, studies that control for these variables indicate higher rates of fetal morbidity and mortality associated with in-utero exposure to cocaine. For example, Volpe² reports increased adjusted relative risk (ARR) due to cocaine use for perinatal death (ARR = 2.1, rate = 4%), abruptio placentae (ARR = 4.5, rate = 4%), microcephaly (ARR = 2.1, rate = 16%) and a number of measures of low birth weight and prematurity that are associated with poor outcomes (ARR = 2.4-3.4, rates circa 30%). Since drug abuse is associated with increased risk-taking behavior, infants born to cocaine-using women also have a higher risk of congenital AIDS and STD infections.⁶ Finally, the rate of SIDS mortality is 5-fold to 8-fold higher for infants exposed to cocaine in utero.⁶

In a lengthy article examining perinatal issues of drug abuse, Bell and Lau⁶ summarize: "The toxic effects of cocaine jeopardize the survival of the baby prenatally and postnatally. After the baby survives, the long-term outlook is compromised both through physical anomalies and neurobehavioral alterations, which together manifest a great morbidity from this cocaine abuse." Consistent with this summary, I suggest that the probability mentioned above, and the grievous nature of the risks to the fetus associated with in-utero cocaine exposure, justify breaches of confidentiality, even if they result in maternal incarceration. This conclusion is further supported by the fact that society will be harmed if scarce and costly resources are expended to care for a child damaged by in-utero cocaine exposure. Indeed, in-utero cocaine exposure is thought to cost an additional \$500 million dollars annually (just for perinatal events).³

Although risks to the fetus are sufficiently grave, breaching confidentiality is justified only if it actually protects the fetus. In the case of ethanol exposure, a legal drug with a high probability of causing significant damage to the fetus, congenital defects are due largely to teratogenic effects of exposure during the first trimester. Hence incarcerating a woman to stop ethanol consumption during her second or third trimester would

offer little or no protection against congenital defects.

In contrast, cocaine is at best a weak teratogen. Most of its deleterious effects on the fetus are due to maternal and fetal hypertension. This hypertension imposes both acute and chronic risks throughout gestation.²

For example, even a single prenatal exposure at any stage of pregnancy may result in an aneurysm or clinically significant ischemic infarction of the fetal brain. Because the fetus will be afforded a degree of protection regardless of when the cocaine exposure is stopped, a breach in confidentiality resulting in maternal incarceration is justified.

Breaches of confidentiality to protect the fetus will be counter productive. Breaches of physician/patient confidentiality will erode trust: an intrinsically valuable as well as a practically useful commodity.

Furthermore, if a risk of prenatal health care for the cocaine user is incarceration, then the cocaine user is likely to completely eschew prenatal care. It is interesting to note that prenatal care, even without drug treatment, may abrogate the risks to the fetus associated with in-utero cocaine exposure.¹ Hence, a policy with disincentives for prenatal care (potential incarceration) could be disastrous for the fetus, harmful to the mother, and erode physician/patient trust. Finally, the cost to society of gestational cocaine use has been used as a justification for breaching confidentiality and incarceration. However, the cost and impracticality of incarcerating tens or even hundreds of thousands of pregnant women also argues against this policy.

Conclusion

Determining if a physician can justifiably breach patient confidentiality requires a complex interplay of scientific, ethical, legal, and practical issues. In the case of in-utero exposure to cocaine, I conclude that the risks to the fetus are sufficiently high, and the possibility that incarceration will protect the fetus sufficiently good, to justify such actions. However, such a policy is likely to prove counter productive in the long term. □

Acknowledgments: *The author thanks Kenneth DeVille for critiquing this essay. See reference 7 for a different perspective and a broader treatment of issues surrounding pregnancy and substance abuse.*

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The Problem of Urinary Incontinence in the Elderly

Jacob Laubach, MSIV

Urinary incontinence—the involuntary loss of urine so persistent or extreme that it causes social or health-related consequences—affects individuals of all ages, but particularly the elderly. More than 10 million adults (including half of all nursing home residents) are incontinent of urine.¹ Affected individuals struggle with the physical hindrance it causes, the embarrassment it brings, the costs it imposes for evaluation and treatment, and the dependency it creates on those who provide care. In addition to its physical and emotional costs, the annual costs for diagnosis and management of urinary incontinence total over \$10 billion.¹

Despite its prevalence and costs, the American health care system as a whole has done little to address the problem of urinary incontinence. Elderly individuals, especially those who move from home to hospital or long-term care facility, bear the heavy burden of ineffective management. In this paper, I look at the evaluation and management of urinary incontinence in patients who move to or permanently live in long-term care facilities. I describe the condition itself, the associated costs, and the obstacles to effective management and how to overcome them.

Urinary Incontinence in Long-Term Care Facilities

The elderly are most at risk for incontinence because of the physiological and anatomical changes of aging. Observed prevalence rates vary depending largely on the definition of incontinence, but most health professionals accept a figure of 15% to 30% as the likely prevalence in elderly people living in the community; the prevalence is considerably higher (nearly 50%) among elderly residents of nursing homes.² Women are twice as likely to be incontinent as men, possibly because of childbearing, but this research has not been conclusive. Parity is simply

one of a list of risk factors such as age, urinary tract infection, menopause, genitourinary surgery, chronic illness, and the use of certain medications.² There is no difference in prevalence based on race.

Urinary incontinence appears in various forms. Incontinence is caused by pressure imbalance within the genitourinary system. Pathologic conditions that cause bladder pressure to exceed that within the outflow tract cause involuntary urine flow. Conversely, pathologic conditions that lower pressure within the outflow tract also lead to involuntary voiding. Intrinsic conditions that lead to incontinence may act alone or in synergy with others. For example, urinary tract infection and drugs together may cause incontinence, but not either alone. The most common forms of incontinence in the elderly are stress incontinence, urge incontinence, overflow incontinence, and a mixed (combined) form of incontinence.¹

Effective management requires thorough diagnosis. Accurate diagnosis relies on the clinical integration of information from the individual's history, physical examination, and specialized studies. Historical information may be obtained from the patient or the patient's family. Close attention must be paid to the frequency, duration, and volume of urination, and to the individual's general neurological and urological status. The physical exam can confirm or dispel suspicions raised by the history. Finally, evidence from cystometrography, cystourethroscopy, and ultrasound can assist in the diagnosis of urinary incontinence.

Urinary incontinence requires specialized treatment. Treatments for urinary incontinence fall into one of three categories: pharmacological, surgical, and behavioral. Elderly individuals must receive treatment appropriate to their specific type of incontinence, their mental and physical stability, and the social support available to them. Behavioral techniques have received increasing attention in recent years, and for good reason: they are noninvasive, participatory, and free of side effects that accompany medication. Their success relies on consistent and

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intensive effort by the patient. Behavioral therapy can be undertaken either at home or within a long-term care facility, and regimens can be tailored to meet individual needs.

Those who do not benefit from behavioral treatment can be treated with a variety of pharmacologic agents, including bladder relaxants, bladder outlet stimulants, and estrogens.¹ All have been used successfully in different clinical situations, but all have side effects that must be monitored closely. Pharmacotherapy is most effective in those who are closely supervised throughout the day.

Finally, elderly individuals may need surgery if incontinence is refractory to behavioral and drug therapy. Surgery is particularly effective in treating stress incontinence, but clinicians must use caution in weighing the severity of symptoms against the condition of the patient and the patient's chances for recovery from the procedure.

In some cases, palliation is the best treatment. New forms of behavioral therapy, medication, and improved surgical techniques have considerably improved the prognosis for individuals with urinary incontinence during the past 10 years. This is especially true for the surprisingly large number of children, and young and middle-age adults who suffer from this problem. But many of the elderly—for example, those with advanced Alzheimer's disease—gain little from intensive treatment. For these people, palliation is best because they may not have the mental capacity for behavioral or pharmacotherapy, and may not recover well from surgery. For these individuals there are a number of incontinence appliances available, such as diapers, pads, and catheters.

Good management requires individualized treatment. The previous paragraphs underscore two critical points: 1) Urinary incontinence is usually treatable. Researchers are slowly coming to understand the mechanisms underlying urinary incontinence, the risk factors that lead to incontinence, and the best

ways to treat it. Most patients can benefit from behavioral, pharmacologic, or surgical intervention. 2) Effective management demands individualized care. The clinician evaluating an elderly individual for admission to a long-term care facility must search for clues about the pathological mechanism of incontinence. After confirming the etiology through examination and evaluative tests, the information obtained can be applied to treatment.

The Costs of and Payment for Urinary Incontinence

It is clear that urinary incontinence imposes considerable physical and emotional burdens on those affected and those who provide their care. In addition, there are sizable monetary burdens as well. Direct costs include payments for diagnosis, treatment, ongoing care, and management of incontinent individuals.³ Indirect costs arise from work missed because of medical appointments or to care for an affected individual.

Long-term care facilities, such as nursing homes, incur substantial costs because of urinary incontinence. In addition to the costs of physician visits and consultations, laboratory tests, and other diagnostic procedures, nursing homes must provide the labor, supplies, and laundry required to care for incontinent residents.³ Since over 50% of nursing home residents are incontinent, it is not surprising that the aggregate cost of these services come is extremely high but variable depending on the setting of care, the degree of incontinence, the functional status of the incontinent individual, and the techniques used to manage incontinence.

In a 1989 study, Teh-wei Hu of the University of California-Berkeley School of Public Health calculated total costs of incontinence-related care in nursing homes. The results (Table 1, at left) show that, in 1989, the total costs of urinary incontinence-related care in nursing homes was over \$3 billion.³

Undoubtedly, inflation and the expanding elderly population have pushed costs higher since that time. More than 90% of incontinence-related costs can be ascribed to two components of care: routine care and admissions to nursing homes solely because of urinary incontinence. As part of his analysis, Hu found that 5% of all Pennsylvania nursing home residents said urinary incontinence was their chief reason for admission. He based his estimate of the nationwide cost of added admissions to nursing homes on this percentage and on the then-current annual per person cost of nursing home care (\$27,350).

In addition to its effect on nursing home admissions, urinary incontinence adds to the cost of hospitalization. Acute

Table 1. Urinary incontinence-related health-care costs in nursing homes³

| Cost category | Millions of 1987 dollars | Percent |
|--------------------------------------|--------------------------|---------|
| Diagnosis; medical evaluation | 6.0 | 0.2 |
| Treatment | | |
| Surgery | 1.2 | 0.04 |
| Pharmacy/drug | 0.7 | 0.02 |
| Routine care | | |
| Without catheter | 1906.2 | 58.4 |
| With catheter | 104.7 | 3.2 |
| Incontinence consequences | | |
| Skin irritation | 70.6 | 2.2 |
| Urinary tract infection | 85.3 | 2.6 |
| Falls | 1.2 | 0.04 |
| Added admissions | 1087.7 | 33.3 |
| Total nursing home costs | 3263.8 | 100.0 |

care facilities do not admit patients for treatment of urinary incontinence, but a patient admitted for another condition must have incontinence treated while in the hospital. This adds considerably to the length (and cost) of hospital stays. A study by the Michigan State Center for Policy Analysis in Aging and Long-term Care found that individuals with urinary incontinence spent an average of nine more days in hospital each year (compared to those without incontinence).³ These added days cost \$2.4 billion.³

Individuals and nursing homes pay for incontinence care.

Private insurance companies, Medicare, and Medicaid do not currently cover the costs of routine care for urinary incontinence (which amount to 60% of the total associated costs³). This means that individuals and long-term care facilities must bear most of the expense. Furthermore, private insurers and government programs usually subsidize only a portion of the necessary diagnostic and therapeutic services, although they do cover surgical procedures and catheterizations. But for many older individuals surgery is not an option because of their general health status, and chronic catheterization is a double-edged sword because it causes physical discomfort and often leads to urinary tract infection. Despite the risks and costs, nursing homes often catheterize as the first (and last) resort for residents with urinary incontinence.

Barriers to Effective Management

The 1989 National Institutes of Health Consensus Development Conference on urinary incontinence identified a number of barriers to effective care: underreporting by patients, underrecognition by clinicians, inadequate education of health care providers, and understaffing at long-term care facilities.² The identified barriers fell into broad categories, some related to the medical system through which services are delivered, and others to individual patients or medical professionals.

Lack of integrated care. Under our current health care system, long-term care, acute care, and home-based community care are not well integrated. The lack of coordination compromises the patient's well being, particularly during periods of transition when patients are strained by the effects of illness and disoriented by changes in environment. Those are just the times when patients most need continuity of care. Poor communication between providers makes continuity difficult—if not impossible—to achieve. As a result, staff members at long-term care facilities may simply catheterize an incontinent patient without determining whether this is the best treatment, and without exploring the possible benefits of behavioral or pharmacotherapy. This means that the patient may not receive appropriate management of incontinence.

Lack of coordination of services and the resulting inappropriate management ultimately harms long-term care facilities as well as patients. Catheterizing patients instead of offering

behavioral therapy may actually cause the urinary tract infections, skin rashes, or other conditions associated with poorly managed urinary incontinence. Over the long run, bad care costs more and decreases the level of patient satisfaction. Acute and long-term care-providers must tailor treatment to the specific needs of incontinent individuals.

Elderly patients underreport their condition. Elderly patients fail to report incontinence for a variety of reasons: because they are embarrassed, because they are ignorant about diagnostic measures, or because they are worried about what treatment will entail. Many simply accept urinary incontinence as a natural byproduct of the aging process. A 1988 study of incontinent women in New Zealand found that the most common reasons for failing to report the condition to health professionals was a conviction that the symptom was "normal" or the expectation of little benefit from treatment.⁴ Another study found that most elderly individuals believe that symptoms related to the eyes, ears, and genitourinary system are "natural" manifestations of aging, even though the same individuals believe that symptoms related to the cardiopulmonary, alimentary, and locomotory systems are pathological.⁵ An elderly person may view incontinence simply as an embarrassing inconvenience to be dealt with at home compared to ailments like congestive heart failure or chronic gastritis. Without knowing about the therapeutic options available or the considerable benefit that they might confer, the incontinent patient is unlikely to seek appropriate medical care.

Uninformed medical professionals undertreat urinary incontinence. Many doctors and nurses express the same sentiments and hold the same misconceptions about incontinence as their patients. Health care professionals must disabuse themselves of the view that the condition is a natural byproduct of aging, even though the prevalence of incontinence among the elderly (and especially among nursing home residents) seems to support it. Urinary incontinence may be common, but it is not "natural." Furthermore, we know that the condition can be effectively treated. Medical professionals need to get their information right, so that individuals with urinary incontinence can receive good care.

Bad reimbursement does not provide a good incentive. As discussed earlier, private- and government-sponsored insurance programs presently cover few services (except surgery and catheterization) for urinary incontinence. Reimbursement programs thus create an incentive for catheterization. Unfortunately, this provides many patients less benefit than other therapies. Low-income and elderly individuals who rely on Medicare and Medicaid suffer most under this system. Limited by the constraints of capitated payment systems, nursing homes provide only the services covered by insurance programs. This ultimately harms both patients, who may get inappropriate care, and the health care system itself, which incurs higher costs as a result.

Recommendations

A number of barriers stand in the way of effective management of urinary incontinence. Some have to do with delivery systems and reimbursement programs, and others concern the attitudes and practices of patients and health professionals. Because of the wide range of these impediments, there is no simple, unidimensional solution to the problems. I list below a number of specific recommendations to improve the quality of care for individuals with urinary incontinence.

Integrate and coordinate the services of care providers This is a critical first step toward improved care for a variety of medical conditions. Integration and coordination will particularly benefit individuals who move between long-term, acute, and home-based services. Social health maintenance organizations serve as a model for integrated elderly care in the future. As of 1994, there were four social HMOs throughout the country. Financed through Medicare and Medicaid payments, premiums from members with private insurance, and copayments by members, social HMOs provide Medicare Part A and B benefits, prescription drugs, and up to \$1000/month for community long-term care and short-term nursing home services.⁶ On admission, new members undergo a comprehensive evaluation of all relevant information about past medical history. Thereafter, a team of service coordinators, including nurses and social workers, manages the care of an individual patient. Service teams have a thorough understanding of each patient's medical condition and unique needs, a perspective particularly important at times of transition from one care environment to another. Members of the service team communicate with personnel at discharging and receiving facilities, identifying needs such as appropriate management of urinary incontinence, and thus making continuity of care possible. Though they remain in their infancy, social HMOs are an important model of how continuity of care for the elderly may be effectively administered in the future.

In the meantime, we can support other, less comprehensive changes to improve the quality of care for individuals with urinary incontinence. Clinical personnel at long-term care facilities can comprehensively evaluate patients with urinary incontinence, either to make a diagnosis or confirm a previous one. Changes in the level of incontinence can be documented. Management needs can be identified and treatment started.

Information to change patient attitudes. Individuals with urinary incontinence need to know that their condition is not simply a "normal" byproduct of the aging process. Changing misconceptions must begin with dissemination of information.

Staff at community clinics, outpatient hospital offices, and long-term care facilities can provide information about urinary incontinence. Brochures and educational programs can emphasize the prevalence of the condition so that sufferers will realize that they are not alone. We need to encourage individuals to speak openly and seek the assistance of medical professionals. Our educational programs should stress the importance of a thorough evaluation and patient-specific treatment.

Teach medical professionals how to manage incontinence.

The prevalence of urinary incontinence and its costs to society make it essential that medical professionals become adept at managing the problem. Those who care for the elderly must learn to sensitively ask questions about urinary incontinence and a variety of other conditions. How does one best deal with a patient who dismisses symptoms as a natural result of aging? Does a patient not report symptoms simply because he cannot interpret them against the background of other, more extreme symptoms? Does the threat of long-term treatment dissuade elderly patients from seeking appropriate medical care? These are questions practitioners must address.

Reimburse to create incentives for quality management. Both private and government-run insurance should cover significant portions of incontinence-related costs. Presently they do not. Changing the system can take place in two steps. First, insurers must act on experimental evidence showing that incontinence requires specific diagnosis and treatment. One size does not fit all when it comes to urinary incontinence, and insurers ought to know this. Second, insurers must recognize that covering the costs of a limited number of incontinence-related services ultimately raises the total cost of care because individuals who receive inappropriate care develop complications.

Conclusion

The number of people affected by and the costs associated with care for urinary incontinence underscore the need for improved management. This means providing care that is shaped by the specific needs of individual patients. Elderly individuals would benefit tremendously from integrated services to make the transition between acute, long-term, and home-based care easier. In fact, care for urinary incontinence could serve as a model for other chronic conditions common to the elderly. Personalized, integrated, and coordinated care will undoubtedly benefit this country's expanding—and aging—population. □

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Will We Be Able to Repair Osteoarthritic Joints?

New Drugs and Surgical Techniques for Cartilage Problems

Louis C. Almekinders, MD

Loss of joint cartilage due to injury or osteoarthritis is one of the most common musculoskeletal ailments seen in primary care, rheumatological, and orthopaedic practices. Although not life-threatening, joint cartilage loss often causes significant disability. This has led to a continuing search for ways to treat, reverse, or even cure cartilage problems and osteoarthritis. In the past two decades we have seen an enormous increase in the number of new techniques available for treating musculoskeletal problems. The replacement of arthritic knees, hips, and shoulders has led this wave of technical advance. Total joint replacements have allowed many patients with disabling arthritis to return to activity.

In spite of our apparent success, total joint replacements are not an ideal solution to the problem of injured or arthritic joints. Failure of the polyethylene surfaces of prosthetic joints, loosening of the metal components or bone cement, and the risk of catastrophic infection make total joint replacement an imperfect solution. Lately there has been a great deal of work on intervening in other ways at a much earlier phase, in an attempt to repair, reconstruct, or even reverse cartilage injuries and osteoarthritis.

Much research has focused on the knee joint because knee cartilage injury and knee osteoarthritis are so common. Often there is no clear distinction between cartilage injury and early osteoarthritis. Joint problems can start as localized, traumatic damage to the cartilage, which then progresses to diffuse osteoarthritis. On the other hand, osteoarthritis can develop without any distinct antecedent injury. In this paper I discuss recent developments in drug and surgical therapy for joints with cartilage injuries and early osteoarthritis.

Drug Therapy

Nonsteroidal anti-inflammatory drugs. Analgesics, including acetaminophen and narcotic drugs, can be used to manage pain associated with cartilage injuries and osteoarthritis, but nonsteroidal anti-inflammatory drugs (NSAIDs) have been the mainstay of drug therapy in osteoarthritis for many years. A number of NSAIDs are currently available, both over-the-counter and by prescription. All of them, including the first of the class, aspirin, are presumed to work mainly through direct inhibition of the enzyme cyclo-oxygenase (which is responsible for the synthesis of the inflammatory mediators, prostaglandins). NSAIDs relieve pain, but none have been shown to modify the natural history of osteoarthritis. In addition, they have significant side effects such as gastrointestinal ulceration, which limit their usefulness, particularly in elderly patients with multiple medical problems. The concern about side effects is made worse by the fact that osteoarthritis is a chronic disease requiring long-term drug use, which increases the risk of side effects.

Newer NSAIDs are continually being developed. In the near future, selective cyclo-oxygenase (COX) inhibiting NSAIDs will likely become available. These so-called selective COX-2 inhibitors mainly block prostaglandin production induced by injury or tissue damage. They do not inhibit the constitutive, COX-1 regulated prostaglandins produced in the stomach, kidney, and platelets under normal physiologic conditions. Since inhibition of COX-1 regulated prostaglandins is thought to cause many of the side effects seen with nonselective NSAIDs, COX-2 selective drugs may produce fewer side effects while still maintaining anti-inflammatory and analgesic

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properties.¹ It is unclear whether their COX-2 selectivity will affect their overall effectiveness in osteoarthritis.

Hyaluronan. One of the newest drugs available for therapy of osteoarthritic joints is injectable hyaluronan. Hyaluronan is a polysaccharide component of both joint fluid and articular cartilage. The size of hyaluronan molecules can be altered by increasing the degree of cross-linking; various hyaluronan preparations currently available differ mainly in molecular weight and in the number of injections recommended for each treatment. Double-blind, randomized studies have shown that directly injecting hyaluronan into osteoarthritic knees produces pain relief similar to oral NSAID use.² Pain relief can last for several months, but the mechanism remains unclear. Restoration of the viscous properties of joint fluid, anti-inflammatory, and analgesic effects have all been proposed as explanation. It seems less likely that hyaluronan can protect or restore cartilage, but this is not certain. Currently, the main use for hyaluronan injections is in patients with knee osteoarthritis who can not tolerate NSAID therapy, and for whom corticosteroid injections are currently our main choice. We need studies comparing injected corticosteroids to hyaluronan and on whether hyaluronan has a place in treating patients who fail NSAID therapy.

Glucosamine and chondroitin sulfate. Several over-the-counter preparations have become popular in the management of osteoarthritis and other cartilage problems. Glucosamine is a small glucose-like molecule found in the large proteoglycan molecules that make up articular cartilage. Chondroitin sulfate is much larger and consists of a long chain of modified glucose molecules. Since both are naturally occurring carbohydrates, they can be purchased as dietary supplements like vitamins. Manufacturers generally claim the compounds can rebuild arthritic or injured cartilage, but these claims are currently not supported by any scientific data. The European literature suggests that these supplements can produce pain relief similar to small doses of NSAIDs.³ Rigorously controlled studies are

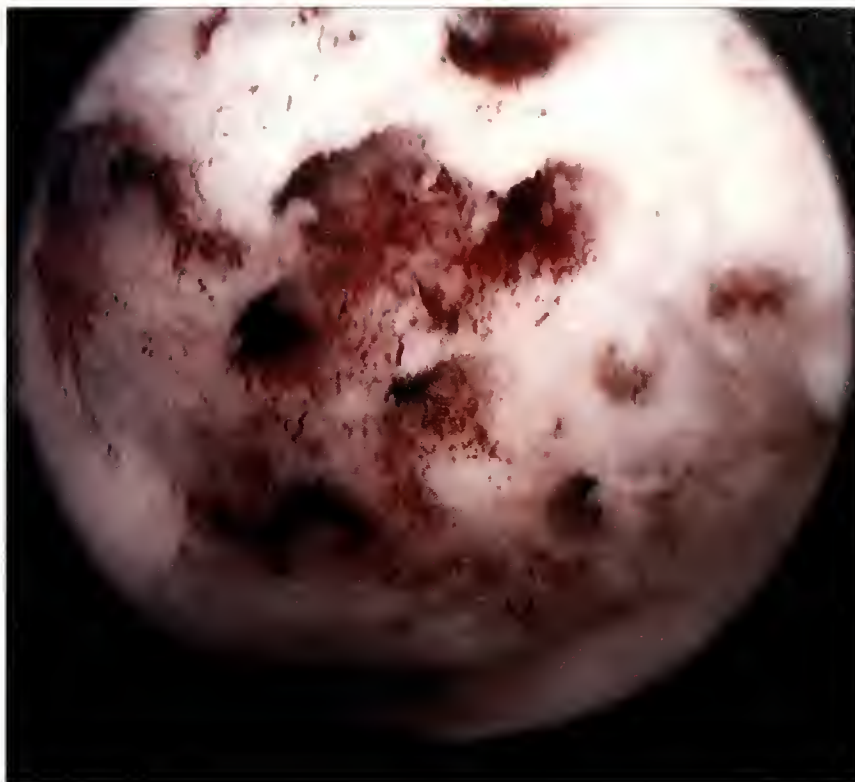


Fig 1: Arthroscopic view of a full-thickness cartilage of the femoral condyle defect during traditional drilling treatment.



Fig 2: Arthroscopic view of mosaicplasty with 2 osteochondral plugs placed for a full thickness cartilage defect.

reportedly under way in the US. Other than their cost, no significant side effects have been reported.

Surgical Treatment

Several new surgical techniques aim to repair or reverse the loss of cartilage in synovial joints. As mentioned before, cartilage loss in the knee can start in different ways. Gradual wear of the articular surface usually begins on the medial knee joint in the weight-bearing area of the femur and tibia. Initially the cartilage softens and splits, leading to later complete loss and exposure of bone. Sometimes the process is initiated by trauma in which a portion of the cartilage is sheared off, thereby directly exposing the bone. The area of exposed bone gradually enlarges and causes wear on the opposing surface.

The traditional surgical technique for treating small, localized areas of cartilage loss consists of drilling the exposed bone (Figure 1, preceding page). Articular cartilage in itself seems unable to regenerate, but when subchondral bone is violated and a bleeding bed is created, mesenchymal cells migrate into the cartilage defect and fill it with fibrocartilage. Fibrocartilage is different from the original articular, hyaline cartilage and can break down with continued use of the joint. New techniques aim at stimulating predominantly normal, hyaline cartilage to repair the defect and avoid subsequent deterioration.

Mosaicplasty. The human knee contains normal, hyaline cartilage that is not actually used for bearing weight. For instance, cartilage on the anterior aspect of the femur has minimal weight-bearing function. In a mosaicplasty, small plugs of this cartilage and underlying bone are removed and "plugged in" to specially prepared holes in the area where new cartilage is needed (Figure 2, preceding page). Several plugs of up to 10 mm in diameter can fill a defect with a maximum diameter of about 2 cm, giving it the appearance of a mosaic. The procedure can be done arthroscopically on outpatients. Initial results are encouraging,⁴ although we still need controlled, long-term studies to compare it to the traditional drilling technique.

Chondrocyte transplantation. This technique is based on the ability of chondrocytes to divide and grow in culture. It is a two-stage procedure. At first, a small piece of normal cartilage is

harvested arthroscopically. Cartilage cells are then grown by a commercial laboratory. Once enough cells have grown (usually several weeks), they are reimplanted in the cartilage defect and covered with a layer of periosteum taken from the tibia. The second procedure requires open knee surgery.

Chondrocyte transplantation was first reported in Sweden, and medium-duration follow-up on those patients has been good.⁵ Chondrocyte transplantation can potentially cover larger defects than mosaicplasty. However, it requires more extensive surgery and the culture process is quite costly. Either technique is currently used for isolated defects and neither can address joints with diffuse arthritic involvement.

Meniscal transplantation. In many patients the initial trauma that starts osteoarthritis of the knee is a tear of the meniscal cartilage which necessitates removal of the injured meniscus. Many patients develop pain even before they have frank osteoarthritis, presumably due to loss of the shock-absorbing function of the meniscus, but complete loss of the meniscus almost inevitably leads to osteoarthritis. In an attempt to avert this process, transplantation of cadaver meniscus can be considered. This can be accomplished arthroscopically or through small incision. Graft rejection does not appear to be a problem because the meniscus allograft is repopulated by chondrocytes from the host. Appropriate sizing of the graft and postoperative shrinkage of the meniscus are technical problems. Pain relief is generally good,⁶ but it is not yet clear that a meniscal allograft can prevent osteoarthritis.

Conclusions

Several of these new medical and surgical developments have left the impression (popularized in the lay press) that osteoarthritis can be halted or repaired with drugs or surgery. These advances show promise, but it is too early to tell whether they can truly alter the natural progression of the disease. So far, hyaluronan has given us an option for patients who cannot tolerate NSAID therapy. Mosaicplasty, chondrocyte transplantation, and meniscal allografts give us additional options for treating isolated cartilage defects that do not warrant total joint replacement. Still, many questions regarding the long-term outcome of these procedures remain to be answered. □

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Carolina Physician's Bookshelf

The Meaning of Mind: Language, Morality and Neuroscience

by Thomas Szasz, MD, Professor Emeritus, Department
of Psychiatry Upstate Medical Center, Syracuse, NY
(Westport, CT: Praeger, 1996, \$22)

Reviewed by Frederick Nesbit, MD,
Psychiatrist, Morehead City

The tremendous value of Thomas Szasz's contributions will most likely never be appreciated during his lifetime. Szasz defies and nullifies some sacred tenets of psychiatric practice. If the full impact of his words were more universally understood and acted upon, the source of livelihood for many practitioners and their imposing institutions would be decimated.

Szasz has expressed himself fluently and incisively on the abuses of psychiatry that deprive people of their basic human rights. In previous writings, Szasz describes the mechanisms by which psychiatric practitioners have achieved quasi-judicial status, resulting in the incarceration of those who have committed no crimes other than behaving or speaking in ways that seem bizarre and thereby threatening.

The term "mental illness" is popularly and wrongly equated with the term "schizophrenia." Schizophrenia is a word more properly limited to its historic origins. Coined by Eugene Bleuler in 1911, it is an anachronistic term he used to label his pioneering attempts to categorize and describe mental disorders. Beyond this, the term has no other value. Unfortunately, schizophrenia is still bandied about by professionals just as if everybody knows what it is, what causes it and how to treat it.

No laboratory test, x-ray or brain scan, psychological test, or drug trial can prove the diagnosis of mental illness (or schizophrenia). Nevertheless, this is the dogma of psychiatry.

In *The Meaning of Mind*, Szasz explores the question: Are "mind" and "brain" two words for the same thing? Is the mind anatomically located in the brain? Is "mental illness" really an illness, a disease? And what about one's moral obligations? Are these subject to becoming diseased? One cannot ignore that we are still in the Dark Ages when it comes to understanding what this is all about. In recent years we have seen tremendous advances in our knowledge of brain chemistry, use of electronic techniques for brain imaging, learning about the pathways of nerve impulse transmission. We also have made important discoveries showing similarities between brain and computer. There nevertheless remains a tremendous gap between what we now know and what has yet to be learned.

Humility has never been a *forte* in our profession, and there is no denying that we put our own interests ahead of altruism. But let's look at a few terms so widely and glibly employed, for which Szasz points out how minuscule is our understanding, and how the vulnerability of those who are seduced by the doctor's authoritarian posturing are commonly being exploited.

"Psychotherapy" is an example of a widely used term that is nothing more than a highfalutin' expression for something that takes place between a person who allows him or herself to become designated as "patient," and another person who is a self-described "therapist." What takes place is nothing more than conversation. The common prescription of court-ordered psychotherapy for criminal offenders is a ridiculous miscarriage of our justice system. It absolves from responsibility the judge, prosecuting attorney, perpetrator, and not least of all, the so-called therapist who thereby profits economically. If these conversations are to be of any help, they cannot possibly take place under involuntary circumstances. In a similar trap of proclaimed logic, the use of involuntary hospitalization behind locked doors is equally unforgivable, not to mention the oft-described news reports about the families and victims of notorious crime or of tragedy: They will "undergo counseling" (whether or not they ask for it, or agree to it).

The hearing of "voices," or auditory hallucinations, is a phenomenon that is now perceived differently than it once was. Magnetic resonance imaging shows us that the idea of one's hearing voices is more likely just the reverse of how it has been perceived. People who supposedly hear voices are actually listening to what they are uttering. Experiments during which imaging was performed on patients while they were actively experiencing what they called "voices" confirms this. The expected brain activity in the auditory area (Wernicke's area) was essentially quiescent. Instead, significant activity was found in Broca's area (speech). Lip movements and even vocalization is commonly noted in people experiencing this activity, which reinforces the concept that this is an act of speaking, not hearing. Thus, we need to reconstruct our perception of "voices" and of theories about disorders of mental functioning.

In the book, Szasz appropriately clarifies many things that he has previously set forth. In addition, he addresses the question of "mind" vs. "brain." In fact, he redefines the individual as being a moral agent, fully responsible for his or her actions. Szasz rejects the concept that one's acts are caused by anything physical or chemical, such as by brain chemistry, chromosome aberrations, or any prior emotional traumas.

The Meaning of Mind offers a refreshing and distinct perspective on what the future holds for our understanding of a fascinating subject. □

Mass Listeria: The Meaning of Health Scares

by Theodore Dalrymple

(London: André Deutsch, 1998, 157 pages, \$17.95)

Reviewed by Mark W. Swaim, MD, PhD, Division of Gastroenterology and Hepatology, Duke Department of Medicine, Durham

"Excess of health causes illness," wrote Gustave Flaubert in his *Dictionnaire des Idées Reçues*. For Theodore Dalrymple, that people's health has never been better is precisely why we fret and see health menaces lurking in food, air, water, sunlight, magnetic fields, and around the next corner.

In *Mass Listeria*, Dalrymple (*nom de plume* for Anthony Daniels, MD, a British psychiatrist) argues that we have come to regard ourselves as having "such mastery over nature that, if life turns out to be unfair, as it always does, human malevolence must be to blame." Worse, medicine's assumed mastery of biology leaves "no room for sadness, only for bitterness."

Dalrymple writes: "We forget that in 1862, a third of all butchers' meat was found to come from animals which had died of disease...that late Victorian ice cream contained, *inter alia*,

cocci, bacilli, cotton fibre, lice, bedbugs, fleas, and human, cat, and dog hair."

Now, we prefer to surround ourselves with dangers that we fondly suppose are unprecedented both in scope and in severity.

Dalrymple is contemplative and well-traveled (*Utopias Elsewhere*, Daniels' incisive account of his visits to ailing socialist societies, is peerless travel writing). He blends gifted people-watching (evoking Desmond Morris) across several cultures into an anecdote frappé of how, when life expectancy is steadily rising, alarmism (and its Janus-twin, faddism) about health are unsteadily escalating. When a friend's relatives wear tin helmets indoors to protect their brains from electromagnetic radiation leaking from electrical outlets, he is certain that many of us have too much healthy time on our hands.

Have we forgotten that we *will* die of something? Dalrymple asks biting. So biting, in fact, that some passages read like Morris morphed into H. L. Mencken. His interpretations of our behavior, which amuse but have an aftertaste of bile, offer little redemption. Dalrymple's diagnoses make fine reading because they are keenly and colorfully correct, but he makes no hint of a prescription. To borrow from a poem by Bertolt Brecht, would that Dalrymple used his head for something other than shaking. □

The Camel's Nose: Memoirs of a Curious Scientist

by Knut Schmidt-Nielsen, PhD, Professor Emeritus, Department of Zoology, Duke University, Durham (Washington, DC, and Covelo, CA: Island Press, 1998)

Reviewed by Francis A. Neelon, MD, Journal Editor

I begin with a confession. I knew Knut Schmidt-Nielsen before I read his memoir, and I knew of his considerable scientific reputation before I knew the man. That out of the way, let me say that I liked *The Camel's Nose* very much. It gives the reader much more than just an account of the author's life circumstances (which to an extent it certainly provides); it also gives a rare, if oblique, glimpse into the inner ticking of the scientist's mind. We get not just an idea of the answers, but also the questions that impelled a man who continuously asked not "Why?" but "How?" How animals learned to live in the harshest of environments; how camels and kangaroo rats could live for weeks or forever in a land without water; how sea birds and turtles and certain frogs refute the mariner's dictum of "water, water everywhere, nor any drop to drink."

Schmidt-Nielsen does tell of his childhood in Norway, his brilliant but unrealized physicist-mother, the distant but steadfast biochemist father, his desultory schooling, the lasting influence of one teacher-mentor, his apparent lack of promise as a university student. The last point seems to me a little far-

fetched to me, given his string of success in attaining positions of note including his long predoctoral apprenticeship under Nobel laureate Egil Krogh in Copenhagen, his appointment as full professor at Duke at age 37, his election to the Royal Society of London and to the French Académie des Sciences, his multiyear tenure as president of the International Union of Physiological Sciences, his reception of the Japanese Emperor's International Prize for Biology. Others obviously saw in him a drive and tenacity and quickness of mind that modesty prevents him from putting on paper in this book. Never mind, we learn enough to puzzle out the truth.

We learn of his early curiosity about how seagulls could survive by drinking sea water. In the late 1930s as a young graduate student, he spent a summer studying sea birds on a barren Norwegian island and learned enough to know that they did not become hypertonic when fed sea water nor did they appear to excrete the excess sodium they ingested through gut or kidney. Obviously frustrated by the lack of answers for his question, he had to put the research aside under the press of war and German occupation of Denmark and Norway. After the war, work and fortune brought him to the United States with his first wife (Krogh's daughter, Bodil). His appointment at Duke made the move permanent, and gave him sufficient time that, 18 years after he had begun, he returned to the gulls and discovered that these animals can desalinate sea water by excreting a highly concentrated salt solution from glands in their beak!

We also learn of his abiding interest in the water problems of desert animals, especially the camel about which there was

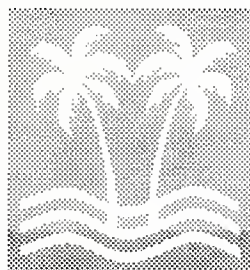
great folklore but, until Schmidt-Nielsen, almost no science. With affection, he tells us about his year (with family) in the Sahara, the beauty and privation of life in the desert and his love for camels. He tells of careful daily measurements of camel weight and body temperature (the camel survives under heat stress by allowing its body temperature to rise), water intake and output, blood tonicity. Eventually, he even figured out why the camel's nose is the camel's nose: it is a vapor trap, dehydrating expired air and retaining the moisture to humidify the next inhaled breath!

Along the way, Schmidt-Nielsen is disarmingly honest about details of his personal life, details that others might have kept hidden. He talks frankly of the dissolution of his first marriage; his loneliness and the subsequent courtship (boyish in full adulthood) of his present wife, Margareta; the tragic losses of his young brother and, later, his youngest daughter; his period of depression and his psychoanalysis. There are details and details, enough to paint us a real picture of this remarkable scientist. He writes a clear, lucid, easy-running prose which does credit to his adopted language (and shows that he learned well the lessons in writing English begun under Egil Krogh and nurtured by years of teaching scientific writing and editing).

There are some shortcomings. At times the pace of events seems awfully fast, so that we are left wondering what led up to some event that almost miraculously "happens" (this is more common toward the end of the book—and therefore the latter parts of the author's life—when, I suppose, there just always were more things going on). There is a lot of attention to meals eaten and wine drunk. I would have liked an index. But those are quibbles. Overall, this is an awfully good book, worth reading if only to get a real look at what we mean by "scientist," a word deriving from the Latin *scire*, to know. A word that should be applied not to one who knows, but who comes to know, one who by diligence and perseverance and bulldog tenacity gets answers to questions that bubble up and will not go away. I thank Knut Schmidt-Nielsen for pulling back the curtain on what is often a mysterious and hidden part of the scientist's life—the interior record of what happened along the path of life's journey. □



Professor Schmidt-Nielsen rests his hand on his stone likeness that stands, along with a statue of a camel, near the Biochemistry Building on the grounds of Duke University, Durham. Photo by Jim Wallace, ©Duke University Photo.



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The Pus is Moving

A Case of Cutaneous Myiasis

David Sokal, MD, and Christian Lambertsen, MD

We report the case of a 41-year-old white man who traveled to Ghana on business in early September 1996, and remained there for about 1 1/2 weeks. In mid-September, he noticed a small, tender spot on his neck. At first he thought it was simple skin trauma from shaving, but over the next four to five days, the tender spot became larger, inflamed, more painful, and began oozing a seropurulent exudate. By this time he was back in the United States and sought medical advice.

On the anterior aspect of the left side of the patient's neck there was a small round hole about 2 mm in diameter in the center of a furuncle from which an exudate was draining. One of us (DS) had lived and worked in Burkina Faso, West Africa, for several years, and had seen a similar lesion in a family member. On close examination through the hole, we could see motion inside the lesion. At first we thought the motion might have been due to respiration, but on careful inspection, there was no correlation with respiration. The base of the hole was white with a small black spot. The small black spot was the respiratory spiracle of a larva of the tumbu fly, a common cause of human disease in West Africa.

The diagnosis was human myiasis, infestation with a fly larva. The larva was removed surgically by CL, who noted that the larva was actively motile and retreated from the skin surface when touched. Due to the larva's active retreat from the surface, a skin hook was needed to extract it. The larva measured approximately 1.5 cm by 0.5 cm. The wound was allowed to granulate during a period of two weeks. No antibiotics were needed.

Discussion

Myiasis is common in many tropical countries, but rarely seen in the United States. In West Africa the tumbu fly (*Cordylobia anthropophaga*) is the common cause of cutaneous myiasis.¹ In Mexico and Latin America the human bot fly (*Dermatobia hominis* or *torsalo*) is the major cause.² Some species of flies that cause myiasis must lay their eggs in broken skin, but neither the tumbu fly nor the human bot fly require broken skin.

The tumbu fly lays its eggs on moist clothes or in sand. A larva can live up to 15 days without feeding; once it makes contact with a host, it penetrates the skin and begins to grow and mature. A number of vertebrate hosts, including humans, are susceptible to tumbu fly larvae. If left undisturbed, a larva feeds and matures for 8-12 days, then crawls out of the skin and drops to the ground where it pupates and develops into a mature fly. In humans, the symptoms produced by the infestation usually lead to removal of the larva before it matures.

In West Africa, clothes are usually ironed after being hung out to dry, which may prevent tumbu fly infection by killing the eggs or larvae. Humans may become infected by single or multiple larvae, usually on exposed skin surfaces. One possible source of infection in our patient was a damp beach towel that he had wrapped around his neck following a day on the beach. However, based on the timing of the symptoms, an inadequately ironed shirt collar also might have been the source of infection.

Despite occasional articles on myiasis in the US literature (see the *North Carolina Medical Journal*, 1986;47:515-6), the condition is still rare and may not be recognized by many physicians. Some authors recommend against surgical extraction, saying that operation may increase morbidity. Other methods of extraction that have been proposed include the use of lidocaine,³ and the use of fatty substances to occlude the breathing hole. When the breathing hole is covered with bacon fat,⁴ or other substances, the larva may emerge spontaneously in search of air over the course of several hours. In our patient,

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surgical removal was easily performed with no complications.

In discussing treatment strategies, Brewer et al note important differences between infestations by the human bot fly and

the tumbu fly, and discuss implications for prevention and treatment.⁵ Brewer et al suggest that human bot fly larvae may be more difficult to remove surgically than tumbu fly larvae. □

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CME Calendar

January 14

Women & Children Mental Health Series: Helping Parents Understand and Manage Infant and Toddler Behavior

Place: WakeMed, MEI, Room 1 & 2
Fee: \$25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave.,
Suite G03, Raleigh 27610-1255

January 28

Women & Children Mental Health Series: Helping Parents Understand and Manage Infant and Toddler Behavior

Place: Charlotte AHEC
Fee: \$25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861,
Charlotte 28232-2861

February 11

Women & Children Mental Health Series: Working with Multi-Challenged Families and Their Infants

Place: WakeMed, MEI, Room 1 & 2
Fee: \$25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave.,
Suite G03, Raleigh 27610-1255

February 12

Dermatology for the Non-Dermatologist

Place: Babcock Auditorium, Wake Forest University School
of Medicine, Winston-Salem
Credit: 7 hours Category 1, AMA
Fee: physicians: \$135, PAs: \$115, residents: \$85, students: \$55
Info: WFU Office of Continuing Education, Medical Center
Blvd., Winston-Salem 27157, 336/716-4450, 800/277-7654

February 25

Women & Children Mental Health Series: Working with Multi-Challenged Families and Their Infants

Place: Charlotte AHEC
Fee: \$25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861, Charlotte
28232-2861

February 27-March 2

4th Annual National Comprehensive Cancer Network Conference: Practice Guidelines and Outcomes Data in Oncology

Place: Marriott Harbor Beach Hotel, Fort Lauderdale, FL
Info: NCCN Conference, c/o PRR, Inc., 516/777-3800, ext. 300

March 8-11

Alton D. Brashear Postgraduate Course in Head & Neck Anatomy

Place: Virginia Commonwealth University, School of Medicine,
Department of Anatomy, Richmond, VA

Credit: 44 hours, Academy of General Dentistry

Fee: physicians: \$450, residents: \$300
Info: Hugo R. Seibel, MD, VCU Department of Anatomy, P.O.
Box 980709, Richmond, VA 23298-0709, 804/828-9791

March 10-13

NCMS Spring Conference & Leadership Symposium

Place: Embassy Suites Hotel, Cary
Info: Contact Dana Hammermeister, NCMS, 800/722-1350 or
919/833-3836, fax: 919/833-2023
e-mail: dhammermeister@ncmedsoc.org
Internet: <http://www.ncmedsoc.org>

March 26-27

Neurology Update and Practical Pediatrics (separate courses)

Place: Winston-Salem
Credit: 12 hours (Neurology), 9 hours (Pediatrics)
Info: WFU Office of Continuing Education, Medical Center
Blvd., Winston-Salem 27157, 336/716-4450, 800/277-7654

April 9-10

19th Annual James Harrill Lecture

Place: Winston-Salem
Credit: 6 hours Category 1, AMA
Info: WFU Office of Continuing Education, Medical Center
Blvd., Winston-Salem 27157, 336/716,4450, 800/277-7654

April 23-30

58th Annual American Occupational Health Conference

Place: Ernest N. Morial Convention Center, New Orleans
Info: American College of Occupational and Environmental Medi-
cine, Education Dept., 55 W. Seegers Road, Arlington
Heights, IL 60005, 847/228-6850, ext. 180,
Internet: <http://www.acoem.org>

April 30-May 1

12 Annual Surgical Symposium

Place: Winston-Salem
Credit: 12 hours Category 1, AMA
Info: WFU Office of Continuing Education, Medical Center
Blvd., Winston-Salem 27157, 336/716,4450, 800/277-7654

May 8-16

Perspectives on Italian Medicine Today

Place: Rome and Florence
Credit: 6 Category 1, AMA
Info: sponsored by Seton Hall University; call 973/761-9692,
fax: 973/275-2370, e-mail: aimgb@aol.com

May 12-14

Carolinas HealthCare System Spring Symposium

Place: Charlotte Convention Center
Credit: up to 24 hours Category 1, AMA

continued next page

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NORTH CAROLINA: BC/BE Family Physician or IM with strong interest in geriatrics for Senior Health Center. Major universities, lake areas, excellent housing and convenient to beaches and mountains. Immediate opening. Send CV to: Lana Wagner, Raleigh Community Hospital, Duke University Health System, 3400 Wake Forest Road, Raleigh, NC 27609. Fax: 919/954-3900.

NORTH CAROLINA: Piedmont Triad—An excellent opportunity for a Family Practice Physician to join a well-established, multispecialty group with seven physicians, three physician assistants, and two nurse practitioners. The group is part of a growing integrated health care system, Novant Health. Candidates must be BE/BC in Family Medicine with excellent training and clinical skills. We offer a competitive salary based on credentials and experience, plus a full benefits package and an opportunity to earn an incentive bonus. The practice is located in Mt. Airy, NC, a growing community with a hometown atmosphere. For immediate considerations send CV to: Novant Health Physician Services, HR Manager, 3333 Silas Creek Parkway, Winston-Salem, NC 27103, fax: 336/718-9860, or call 336/718-4468. EOE.

OBSTETRICIAN/GYNECOLOGIST: University-trained, experienced, Board-certified and recertified, current North Carolina license and DEA, desires locum tenens or other part-time work. Newton B. Griffin, MD, 919/782-1803.

PHYSICIANS NEEDED for locum tenens and permanent assignments in North Carolina family, walk-in, and occupational health care clinics. Mail your CV to Physician Solutions, P.O. Box 98313, Raleigh, NC 27624.

POSITION AVAILABLE: Valdese General Hospital in Valdese, NC, has an immediate opening for a Medical Director for the Problem Wound and Hyperbaric Medicine Program. The program has been established and in full operation for over one year. Office and staff are provided. This is an excellent opportunity for someone looking for their own practice in problem wound management and hyperbaric medicine. We are seeking someone who shares our interest in delivering quality medicine and following ethical business practice. Please send CV to Marcus Healthcare, Inc., 616 FM 1960 West, Suite 210, Houston, TX 77090. For more information, contact Tom Holmes at 281/893-8970 or 205/647-0562.

PUBLIC HEALTH PHYSICIAN: Position available for board-certified family practice physician to work in busy primary care clinic in beautiful Asheville, NC. Liability insurance provided; excellent benefits. Please send resumé/CV to Buncombe County Health Center Personnel Office, 35 Woodfin St., Asheville, NC 28801, 828/250-5206.

CME Calendar continued

Info: Brenda Arnes or Mary Anne Cox, CHS Office of CME, 1366 E. Morehead St., Charlotte 28204, 704/355-8631, 800/562-7314. Internet: <http://www.carolinas.org/symposium/>

May 19

NCMS 150th Anniversary Gala

Place: Raleigh Memorial Auditorium
Info: with the North Carolina Symphony, black tie optional; contact Dana Hammermeister, NCMS, 800/722-1350 or 919/833-3836, fax: 919/833-2023
e-mail: dhammermeister@ncmedsoc.org
Internet: <http://www.ncmedsoc.org>

June 14-19

8th Annual Advanced Cardiovascular Interventions Symposium

Place: Westin Resort, Hilton Head, SC
Credit: up to 21 hours Category I, AMA
Fee: \$850
Info: Carolinas HealthCare System/Charlotte AHEC Office of CME, 1366 E. Morehead St., Charlotte 28204, 704/355-8631 or 800/562-7314

New Members

of the North Carolina Medical Society

Kira M. Alatar (FP), 4001 Claymore Drive, Wilmington 28405
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 John E. Barkley (PUD), 2015 Randolph Road, Ste. 104, Charlotte 28207
 Helene Drewsen Benveniste (AN), 288 Highview Drive, Chapel Hill 27514
 Michelle Sandy Bradbury (RES), 1926 Winding Ridge Road, Winston-Salem 27127
 Michael David Burg (RES), DUMC, Div. Emerg. Med., Box 3096, Durham 27710
 Debra Lynn Bynum (IM), P.O. Box 1381, Spring Hope 27882
 Dennis Czuchra (PHYS ASST), 2026 Market St., Ext., Washington 27889
 Mark Anthony Dubinski (GE), 568 Ruin Creek Road, Ste. 127, Henderson 27536
 Michael A. Gray (IM), 308 Steep Pt. Road, Beaufort 28516
 Steven Donald Hammel (PD), 125 Park St., Ste. B, Canton 28716
 Nicole Dominique Holman (RES), 1406 Hickory Hollow Terr., Antioch Tn 37013
 Stephen Szu-Heng Hsieh (N), 3531 Birkdale Lake Court, Clemmons 27012
 Margaret M. Hurst (PD), 101 Clinic Drive, Tarboro 27886
 Dannie Burton Jonas (PHYS ASST), 505 E. Greenville Blvd., Greenville 27858
 Thomas E. Kingsley (FP), 603 Dolley Madison Road, Greensboro 27410
 Darrell Vincent Lewis, Jr. (N), 141 Carolina Forest Road, Chapel Hill 27516
 Dennis Jay Lipton (RES), 200-208 Laurel Springs Drive, Durham 27705
 Shona Ferrier Martin (IM), 2114 Myrtle Avenue, Raleigh 27608
 Janet Rae Mason (FP), P.O. Box 158, Prieton 27569
 Eric Todd Moser (N), High P.O.int Neurological Assocs, 624 Quaker Lane, 206-C, High P.O.int 27261
 Pamela M. Murphy (RES), 1601 Owen Drive, Fayetteville 28304
 Thomas Edward Parrish (PHYS ASST),

Roanoke-Chowan Hospital, P.O. Box 520, Ahoskie 27910
 Richard A. Sater (N), High P.O.int Neurological Assocs, 624 Quaker Lane, 206-C, High P.O.int 27261
 Patricia Gale Moyer Shannon (RES), 1945 Dunhill Drive, Charlotte 28205
 Todd Mikel Smith (RES), 2211 Daley Road, Chapel Hill 27514
 James Robert Snapper (PUD), 101 Ukiah Lane, Chapel Hill 27514
 Richard Walter Trombley (PHYS ASST), 2809 Highway 134, Troy 27371
 Patricia Dockery Weavil (PD), Thomasville/Archdale Pediatric, 200 Arthur Drive, Thomasville 27360
 Sue Karen Wink (OTO), 319 S. Broad St., Edenton 27932
 Martyn Dean Woleben (OBG), 2317 Hickwood Road, High P.O.int 27262

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 William Keith McKibbin (ORS), 111 Victoria Road, Asheville 28801

 Burke
 Deborah Hogan Davis (FP), Burke Primary Care, 103 Medical Heights Drive, Morganton 28655

 Cabarrus
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 Amin Aziz Charania (IM), Carolina Medical Clinic, 236 LePhillip Court, #E, Concord 28025
 Melissa Marlowe Coale (D), Dermatology Group of Carolinas, 335 Penny Lane, Concord 28025
 Steven Edward Magee (FP), 921 Tartan Lane, NW, Concord 28027
 David G. Marcheschi (PTH), 901 Brighton Drive, Kannapolis 28081

Catawba

Sylvia S. Barnes (FP), 2712 Highway 127 South, Hickory 28602
 William Anthony Messer (FP), Northeast Family Practice, 2404 Springs Road, NE, Hickory 28601

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Kenneth Allan Cassell (IM), Valley River Medical Group, P.O. Box 1107, Murphy 28906

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Adam Gregory Delagarza (STU), 224-A Melrose St., Winston-Salem 27103
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Brian Mackenzie (STU), WFUSM, Box 2528, Medical Center Blvd., Winston-Salem 27157
Manisha J. Patel (STU), WFUSM, Box 2538, Medical Center Blvd., Winston-Salem 27157
John Arthur Harris Porter (N), Salem Neurological Center, PA, 3333 Brookview Hills Blvd., #107, Winston-Salem 27103
Charles Herman Tegeler, IV (N), WFUSM, Medical Center Blvd., Winston-Salem 27157
Thomas Wannenburt (C), WFUSM, Medical Center Blvd., Winston-Salem 27157

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Aregai A. Girmay (FP), 991 W. Hudson Blvd., Gastonia 28052
James Moss Heery (C), Sanger Clinic, 2555 Court Drive, #200, Gastonia 28054
Jaime Villareal (IM), 1896 Remount Road, Gastonia 28054

Greater Greensboro Soc. of Med.

Ravisankar R. Avva (IM), Guilford Medical Associates, 2703 Henry St., Greensboro 27405
Kyle Lawrence Cabbell (NS), Guilford Neurosurg. Assocs., 301 E. Wendover Ave., Ste. 211, Greensboro 27401
Dayne Daniel Hassell, III (R), P.O. Box 13005, Greensboro 27415
Steven Craig Hendrickson (GS), 2704 Henry St., Greensboro 27405
Jeffrey David Jenkins (NS), Guilford Neurosurg. Assocs., PA, 301 E. Wendover Ave., Ste. 211, Greensboro 27401
Strathmore Keith McMurdo, Jr. (DR), Triad Imaging, 1301 W. Wendover Ave., Greensboro 27408

Henderson

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Duan Robert C. Scott, II (AN), 284 Capps Road, Hendersonville 28792

Lenoir-Greene

James Joseph Gibson (OBG), Kinston Clinic North, Ste. E, Kinston 28501

Mecklenburg

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Kimberly C. Herrman (PD), 427 N. Wendover Road, Charlotte 28211
Francis Joseph Kosarek (R), 6833 Linkside Court, Charlotte 28277
Hugh Munro Lovejoy, Jr. (OTO), 101 W.T. Harris Blvd. Ste. 5103, Charlotte 28262
John Gray Norris (IM), Carolina Asthma & Allergy Ctr., 2711 Randolph Road, Bldg. 400, Charlotte 28262
Edward Jeffrey Oke (DR), Mecklenburg Radiology Assocs., P.O. Box 221249, Charlotte 28222
Susan Dru Thomas Quarles (IM), First Charlotte Physicians, 300 Billingsley Road, Ste. 200, Charlotte 28211
Merchline M. Riddlesberger, Jr. (DR), Mecklenburg Radiology Assocs., 2022 Vail Ave., Charlotte 28207
Cynthia Shahan (P), Eastover Psycho./Psy. Assocs., 3303 Latrobe Drive, Charlotte 28211
Elizabeth Louise Tripp (EM), 16009 Covington Point Lane, Huntersville 28078
Daniel Steven Uri (R), Mecklenburg Radiology Assocs., 2022 Vail Ave., Charlotte 28232

Moore

David Martin Furie, 370 Diamondhead Drive, Pinehurst 28374
Cile Harding Williamson (OBG), Pinehurst Surgical Clinic, 1 Memorial Drive, Pinehurst 28374

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Robert Thomas Stone, Jr. (OPH), Watson Eye Associates, 400 Nash Medical Arts Mall, Rocky Mount 27804

New Hanover-Pender

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Onslow

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Pitt

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Craig Frelberg (STU), 523-H Spring Forest Road, Greenville 27834
Ronald Charles Landry (EM), ECU Physicians, Dept. of Emergency Med., Greenville 27858
Kathleen Vient Previll (PD), ECU School of Medicine, Brody Bldg., Greenville 27858
Melvin Wayne Ressler (GS), Carolina Physicians, 800 Moye Blvd., Greenville 27834
David Loren Tait (OBG), ECU School of Medicine, Dept. of Ob-Gyn, Greenville 27858
Harold James Williams (PTH), ECU, Dept. of Pathology, Brody 7S-10, Greenville 27858

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Mohammed Abdul Jaleel (IM), Semp Southeast Med. Practice, 403 W. 27th St., Lumberton 28358
Gail Ann Leget (ON), Southeaster Care Center, 1200 Pine Run Drive, Lumberton 28358

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Aphorisms of the Month

Daniel Sexton, MD, Section Editor

"A Cynic's View of Reformers"

Reform must come from within, not from without. You cannot legislate for virtue.

—James Cardinal Gibbons

Nothing so needs reforming as other people's habits.

—Mark Twain

Reform has no gratitude, no prudence, no husbandry.

—Ralph Waldo Emerson

Most reformers wore rubber boots and stood on glass when God sent a current of common sense through the universe.

—Elbert Hubbard

A reformer is a guy who rides through a sewer in a glass-bottomed boat.

—Jimmy Walker

Reform for its own sake seldom thrives.

—John Quincy Adams

When Dr. Johnson defined patriotism as the last refuge of a scoundrel, he ignored the enormous possibilities of the word reform.

—Roscoe Conkling

A man that expects to train lobsters to fly is called a lunatic, but a man who thinks men can be turned into angels by an election is called a reformer and remains at large.

—Finley Peter Dunne

We are reformers in Spring and Summer; in Autumn and Winter we stand by the old; reformers in the morning, conservers at night.

—Ralph Waldo Emerson

Section editor is Dr. Dan Sexton, Box 3605, DUMC, Durham, NC 27710. e-mail: sexto002@mc.duke.edu

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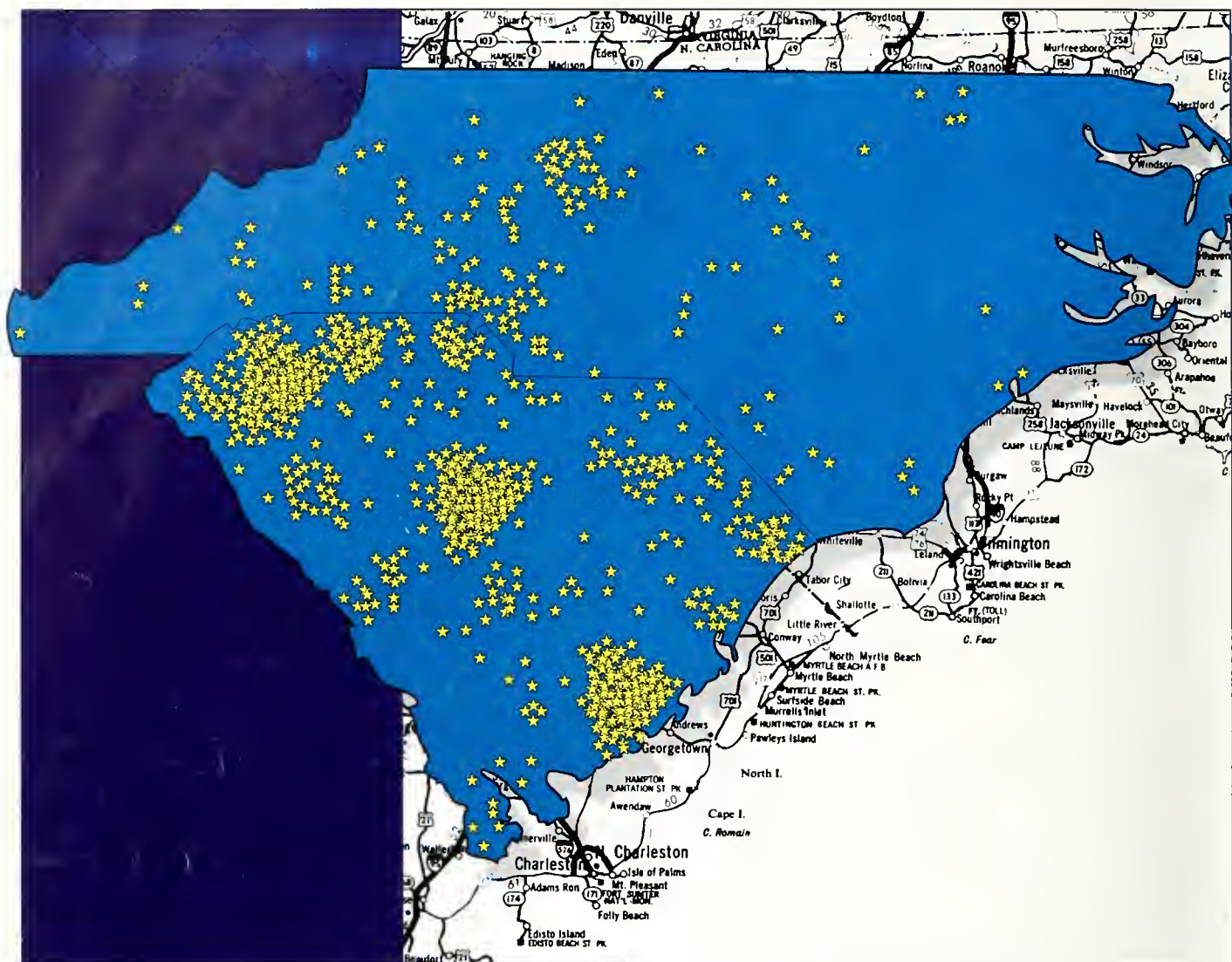
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What can a map tell you about a computer system?

Plenty — if, like this one, it shows how many medical offices in the Carolinas use a particular practice management system to run more efficiently, effectively, and profitably.

For example, it might show how a 16-year commitment to "Working for Physicians" has resulted in over 800 installations in North and South Carolina.

It might bring home how features like "on-the-fly" refiling, encounter-form tracking, and direct transmission to North Carolina Medicare, Medicaid, and Blue Cross/Blue Shield (with no per-claim charges) are improving physicians' revenue.

It could clarify how critical "one-call" support can be in helping offices stay productive — how telephone support staff, software and hardware engineers, technicians, trainers, and a fleet of service vans can provide support unmatched in the industry.

It might demonstrate how on-going research and development brought innovations like the first integrated, direct electronic claims transmission in a practice management system.

Or it could validate the concept of regional focus: By selling systems only in the Southeast, a computer company can keep customers up-to-

date on the latest insurance filing requirements.

It could emphasize the flexibility of multi-user, multi-tasking software that runs on the most popular operating system in the world.

And it could illustrate the value of having a computer vendor with a vision for the future and the expertise to make that vision work for you.



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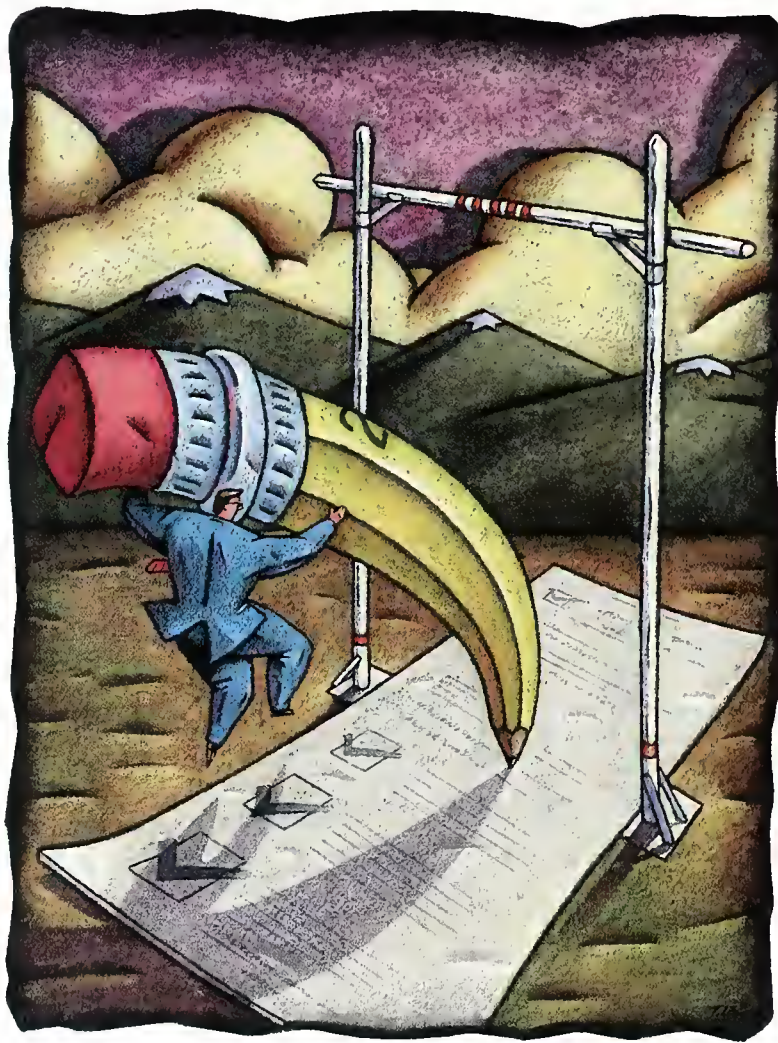
North Carolina Medical Journal


For Doctors and Their Patients



*Bad Times in 'the Goodliest Land':
Poisoning in North Carolina*


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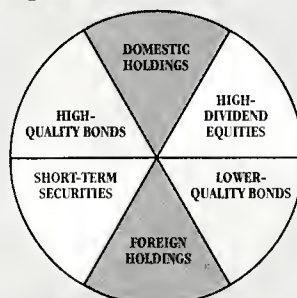
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For Doctors and their Patients

March/April 1999, Volume 60, Number 2

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NORTH CAROLINA MEDICAL JOURNAL

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North Carolina Medical Journal

FOR DOCTORS AND THEIR PATIENTS

March/April 1999 Volume 60, Number 2

Cover: Widespread agricultural use of pesticides and arsenicals makes North Carolina a locus of poisoning activity, both accidental and intentional. The cover illustration, by Chris Huber of Duke Medical Center's Educational Media Services, refers to the recognized, if still unexplained, association between arsenic poisoning and the consumption of moonshine liquor.

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Letters to the Editor

A Friendly Dissent

To the Editor:

My commentary, "An Editorial Counterpoint" (NC Med J 1998;59:282), was written in response to the Managing Editor's request for a sample signature to be used for the Editorial Board's *Condition: Critical! Opportunity: Fleeting!* editorial. I believed that simply saying "no," with the resultant footnote indicating my reluctance to sign the piece, would send a totally negative message. Also, I wanted to applaud the leadership process and comment on the important issues of the proposed resolution.

Furthermore, I did not agree with the "spin" of the three hypothetical questions and answers presented by the Editorial Board; in fact, I did not concur with two of three Board responses to the questions they put forth. Publication boards traditionally focus on policy and fiscal responsibilities. This petition-like statement, a precedent-setting break with tradition, was unnecessary in view of the Editor's response, and I was reluctant to "go along." Indeed, I thought Editor Frank Neelon's well-written and most appropriate editorial, "Why the NC Medical Society Needs a Journal," made the stronger and far more effective argument for continuing the *Journal*. However, like all other journal readers, I did not see this in advance of publication.

In my opinion, the major issue was put forth in the question, "Can we afford to continue the status quo with regard to our communication dollars?" I made three additional points: I recognized the broad-based and lengthy consideration underlying this controversial resolution; applauded the process our leadership used to move this difficult decision along; endorsed strongly the appropriateness of putting the final decision before our elected representatives, the House of Delegates.

The open, constructive, and sometimes emotional testimony at the Reference Committee, and the somewhat more polarized debate than many expected in the House of Delegates, were enlightening, very civil, and helpful for all concerned. The manner in which this emotionally charged issue was debated reflects well on the Delegates and on those representing the *Journal*.

In my view, a fair and reasonable compromise was achieved and was positively accepted by those on either side of the argument. Indeed, our House in its wisdom did alter the status quo, but in a manner that provides an opportunity for the *Journal* to continue.

Frank Neelon, Editor; Ed Halperin, Deputy Editor; and

many others spoke effectively, strongly, and with pointed civility. I listened carefully, as did many others. I was very much in favor of the Reference Committee recommendation and lobbied my Buncombe colleagues to support it.

Finally, I remind the *Journal* readers that the original resolution was not defeated; it was amended by substitution to defer the final decision to a time certain (one year). All of us who enjoy and read the *Journal* should be prepared to offer support to the Editor and to the Editorial Board as they move ahead to develop a stronger business plan and subscription base to preserve the future of this outstanding publication.

F. M. "Mac" Mauney, Jr., MD
#8 Walnut Lane
Fletcher, NC 28732

NC Medical Journal Is the Last of the Real Bargains

To the Editor:

Having been a member of the NCMS for over 30 years and having read a large part of most issues of the *NC Medical Journal*, I wish to compliment all those who have kept alive this excellent publication, which brings unmeasured credibility to the NCMS. The discussion about financing the *Journal* was a low point at the Society's annual meeting and did not complement our membership.

I understand that the NCMS has about 10,000 members, that the annual production cost of the *Journal* is about \$130,000, and, further, that the average cost for a year's subscription would be about \$15. *Health Watch* alone is worth that and more, as it is so helpful in doctor and patient education alike.

I believe the *NC Medical Journal* can stand on its own by selling \$20 subscriptions to active members of the Society and \$10 subscriptions to retired, inactive, student, and resident members. And students and residents could apply to the NCMS Foundation for subscription subsidies, if needed.

Many of our members subscribe to more costly journals that are less directed to the practice of medicine in NC; \$20 per year would be the last of the real bargains for our profession.

The North Carolina Medical Journal: charge for it, pay for it, and appreciate it!

Charles O. Boyette, MD
C. O. Boyette Medical Clinic
216 Haslin Street
Belhaven, NC 27810

Domestic Violence: Report Card Revisited

To the Editor:

The NC Women's Health Report Card documents a number of issues that affect the health of women in North Carolina. Some of the information in Dr. Bapat's fine report (NC Med J 1998;59:364-7), however, may be subject to misinterpretation if the report criteria are not carefully read.

Information on some health categories (such as infectious and chronic disease) is based on incidence data easily obtained from birth and death records, ICD-9 codes, and medical records. Domestic violence (DV) was graded based on the number of clients served by community DV programs, as reported by the NC Council for Women. The numbers given do not represent the true incidence of DV, nor the number of victims seeking medical or legal assistance. The number of victims seen by DV programs increased by 87% from 16,700 cases in 1990 to 31,200 cases in 1996. The grading scale used rated this as an "F", or ">25% worse or current status remains very bad."

On the contrary, while DV is still a very serious problem in NC, the increased number of clients served appears to be due in large part to increased awareness and referrals. Numerous state and local initiatives (the NC Public Health Alliance Against Domestic Violence, the Governor's Task Force on Domestic Violence, the DHHS resource manual and training seminars for health departments, Interact of Wake County, UNC Memorial Hospital's Beacon Program, the Pitt County Domestic Violence Network, and the Greensboro DV Task Force) have been important in addressing domestic violence in our communities. The North Carolina Medical Society has been active as well in DV education and referral, with special editions of the *Journal* (1994 and 1997), sponsorship of photographic documentation seminars, development of a speakers list, and educational displays and lectures at the annual meeting.

Although many North Carolinians still need medical, legal, and community-based help with problems of domestic violence, we are encouraged that almost twice as many people are now referred. Not only are primary care providers identifying more cases, but specialists such as dermatologists, radiation oncologists, and orthopaedic surgeons have come to recognize this significant health problem and are taking steps to combat it. For this reason, I applaud the efforts of Dr. Bapat and the others who compiled this information for our review and action.

Peggy E. Goodman, MD, FACEP
Chair, NCMS Domestic Violence Committee
Associate Professor, Emergency Medicine
East Carolina University School of Medicine
goodman@brody.med.ecu.edu

Curses, Foiled Again!

To the Editor:

While catching up on my reading I came across the case report, "Translaryngeal Puncture in a Collegiate Fencer" (NC

Med J 1998;59:378-80). If my aging memory serves me correctly, however, there is an error in nomenclature in the article. A fencer is a person who participates in the sport of fencing, which falls into three primary categories: foil, épée, and saber.

These three instruments are dramatically different. The épée is significantly stiffer than the foil and would be much more likely to cause a penetrating injury than would the very flexible foil. The cross-sections of these weapons are also radically different. The protective gear used in the three events also differs because there are different touch areas used in scoring. The article, while being very instructive, used foil and épée interchangeably. From the standpoint of injury potential, I suspect that this needs to be clarified.

While I admit it has been many years since I was on the fencing team, I would still suspect that my comments are correct. If I am in error, I will stand corrected.

Leon M. Morrison, MD
Carteret Ob-Gyn Associates
302 Medical Park Court
Morehead City, NC 28557

From the Editor:

Dr. Mark Weissler at UNC, who treated the fencing student, is pretty sure the weapon was a foil: extremely flexible and thin enough to penetrate a frayed area of the Kevlar shield. And Dr. Morrison is quite right. We should have realized that it could be foil or épée but not both. Had we been sharper . . .

Tobacco Restrictions and Restaurant Sales

To the Editor:

I have reviewed an article by Goldstein and Sobel in your journal (NC Med J 1998;59:284-7) regarding environmental tobacco smoke and the impact of regulations on restaurant sales in North Carolina. This is an excellent article and serves to add to the growing body of evidence that, despite tobacco industry propaganda, public health measures to restrict exposure of the public to second-hand smoke do not have negative impact on restaurant receipts. This is an excellent example of how a state medical journal can add to the literature through original peer review studies. I urge you to continue this practice.

W. Mark McCullough, MD
Radiation Oncology Associates, PC
The Medical Tower
425 Third Avenue
Albany, GA 31702-0063

For the Love of a Cat

To the Editor:

As a physician I am well aware that all life (plant, animal and human) must come to an end. Even so, I was utterly unprepared for the death of my cat, Sweet Thing (NC Med J

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Thank you.

1986;47:413-4). It has distressed me more than I would have thought possible. The depth of my feeling amazes me. I wonder if others have felt real grief at the death of a pet as I have.

We always hear that cats walk alone, that they pay little or no heed to a master's voice, that they go their own cat way with superb indifference to their owner's wishes. Sweet Thing was all those things, but he was also affectionate, his love unconditional. When I arrived at a distressing time in my life (divorce), I found a great deal of solace in his company and pleasure in his kitteny ways. Leave an open paper bag on the floor, and he would pounce on it, his tail signaling ferociously. We would play hide-and-seek (a grown man and a small cat) racing through the house, hiding behind chairs, tables, the sofa. Ah, but we enjoyed the game.

As he grew older, Sweet Thing learned my schedule. He would wait at the front door for me to come home from the office. He would peer through the glass panel flanking the door, his nose against the glass, his eyes unblinking. If I got up in the night for a glass of milk, he would follow me to the kitchen and have a little milk in his bowl. He set his internal clock to mine, sitting by my bed, waiting for me to rise in the morning.

Alas, as with so many cats, age brought kidney problems. I refused to believe it could be serious, even when the veterinarian spoke of kidney failure. I was so sure that we would grow old together. I could not imagine life without him. Unfortunately, while I was away, he became very ill. The caretaker called with the news, followed almost at once by the veterinarian announcing Sweet Thing's death.

I never expected to feel such a desolate sense of loss for a pet, but I did. It has been hard to return to the empty house, to find his bowl still filled with uneaten food, his litter box, his playthings. I would think I saw him waiting by the front door, or rushing off to hide beneath a table, or curled up in comfort in the big chair. I even called him once, thinking that he had to be there somewhere. I am not ashamed to admit that what I felt was grief.

Yes, just a pet. But a pet to make you laugh and in the end to make you cry, for the sad part is their lives are so much shorter than ours.

Claude A. Frazier, MD
Doctors Park - Building 4
Asheville, NC 28801

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PIMS: Information for Smarter Decisions

Arsenic Poisoning Seen at Duke Hospital, 1965-1998



Elizabeth Hunt, MD, Shannon L. Hader, MD, MPH, Douglas Files, MD, and G. Ralph Corey, MD

Arsenic's bad reputation derives primarily from its use as a subtle way to dispose of unwanted competitors or spouses. Despite its notoriety as an agent of death from the Renaissance to the present, arsenic has had many functional uses in medicine, agriculture and industry. As early as 400 BC, ancient Greek and Roman physicians were using arsenic to treat dermatitis. Indeed, Hippocrates and Galen are reported to have treated skin ulcers with a paste made from the sulfide of arsenic. Subsequently its use blossomed, so that during the Middle Ages potent topical and oral arsenicals were prescribed for a host of illnesses, but not until the 1800s were formulations standardized. Fowler's solution, a 1% solution of potassium arsenite (available until it was withdrawn from the US market in the 1950s) was used to treat such varied illnesses as asthma, leukemia and psoriasis.

One of the most important medical uses of arsenic was discovered by Hata, who was testing compounds in Ehrlich's laboratory. The 606th compound he tested had significant anti-syphilitic activity. It became Arsphenamine, Ehrlich's "magic bullet" and the standard treatment for syphilis until the penicillin era. Though effective, compound 606 had many side effects including the induction of peripheral neuropathy. An interesting phenomenon occasionally occurred when patients with tabes dorsalis were treated with arsenic: the "syphilitic" neuropathy worsened with treatment, leading the doctors to escalate the dosage to treat "refractory disease"! Despite their toxicity, other arsenic compounds were tested and used against infectious agents, especially tropical parasites. Even today, an arsenic-containing medicine, melarsoprol (Mel B), remains the drug of choice for treating African trypanosomiasis at the meningoencephalitic stage.^{1,2}

In addition to its medicinal uses, arsenic has long been used in farming and industry. Paris Green (copper acetoarsenite), introduced in the 1880s, was the first pesticide commonly used

in modern agriculture.³ It and several other herbicides and rodenticides were, until recently, widely used not only on farms but inside rural and urban houses. In the industrial workplace, arsenic has been used (and has intoxicated workers involved) in the production of tempera, watercolor, oil paints and ceramic pigments; in the smelting of nonferrous metal; and in glass etching.^{4,5} Finally, arsenic has been used in semiconductors and other electronic devices, as well as for such rustic applications as wood preservation.

Fatal Ingestions

Ever since its discovery, arsenic has poisoned humans. Accidental contamination of foods and beverages has been responsible for both small and large epidemics of toxicity. In 1900, for example, approximately 6000 English ale-imbibers became ill (and 70 died) in what was called the Staffordshire Beer Epidemic. An intense investigation revealed that the sulfuric acid used to make the sugar to brew the beer had been manufactured from pyrites contaminated with arsenic.^{6,7} In 1955, in another tragic incident, 12,000 Japanese infants were poisoned with arsenic-contaminated formula; 130 died.⁸ In 1972, 11 people in Minnesota were poisoned by drinking well water contaminated by run-off from soil containing remnants of arsenical grasshopper bait placed 40 years earlier!⁹ Probably the most famous case of unintentional human poisoning involved Clare Booth Luce, US Ambassador to Italy in the 1950s, who became ill after arsenic-containing paint chips fell from the ceiling of the US Embassy in Rome into her food.¹⁰ Today, most cases of unintentional arsenic poisoning have been related to childhood curiosity or the drinking of moonshine whiskey.¹¹ How moonshine becomes contaminated with arsenic remains mysterious. It is possible that arsenical rodenticides contaminate the raw material, or that arsenic is leached from the still's plumbing, or that the whiskey is collected into arsenic-tainted containers.

As an agent of mass killing, arsenic was first used in gaseous form (as Adamsite and Lewisite) for chemical warfare in World War I. In fact, research for an antidote for these poison

Drs. Hunt, Hader, and Files are in the Division of Internal Medicine and Dr. Corey is in the Division of Infectious Diseases in the Duke University Department of Medicine.

gases led to the creation of British anti-Lewisite (BAL or Dimercaprol), one of the currently used antidotes for acute arsenic poisoning.¹² Unfortunately, there is still reason for concern about unintentional exposure to gaseous arsenicals.¹³

Foul Play

While its potential for accidental mischief is great, the true source of arsenic's macabre reputation stems from its notoriety as an agent for *intentional* poisoning, a purpose graphically illustrated in the famous play *Arsenic and Old Lace*.¹⁴ It is unclear just when the lethal potential of arsenic was recognized, but it may have stemmed from its use as a rodenticide. Indeed, until it became possible to detect arsenic in the urine and hair, it was the perfect weapon of skullduggery: tasteless, odorless, soluble in water, fatal in small doses, and readily available.¹⁵ During the Middle Ages, Lucretia Borgia, the Duchess of Ferrara (1480-1519), is said to have used it as a political weapon by poisoning her guests.¹⁰ It is even reported that some Renaissance nobility took small daily doses to protect themselves from acute poisoning (a practice which, unfortunately, only replaced acute with chronic poisoning).¹⁶

During the latter half of the 20th century the focus of arsenic poisoning has shifted to the Southern United States,¹⁷ with North Carolina as an epicenter. Because of its legitimate use as a pesticide for tobacco, apples, peaches, tomatoes, and cotton, arsenic became widely available, and its handiness as a

method to eliminate personal inconveniences soon found its way into local folklore.^{15,16} Several well publicized cases of homicide by arsenic have helped secure its reputation in North Carolina. In the late 1970s, Margie Velma Barfield of St. Pauls was sentenced to die for killing four people with arsenical ant poison. She began by poisoning her mother in 1974 after she had borrowed \$1,000 in her mother's name. Later, she added arsenic to the food of two elderly citizens of Robeson County for whom she provided nursing care. She had forged checks on their accounts and murdered them when they threatened prosecution. Lastly, she poisoned her fiancé when he became angry about a check she had written on his account. Fortunately for her still healthy acquaintances, Ms. Barfield marched into the county sheriff's office on March 13, 1980, and confessed.

A second case involved Blanch Tyler Moore, who was sentenced to death after it was discovered that she had been feeding her boyfriend peanut butter milk-shakes and banana pudding laced with arsenic (while he lay in a hospital bed)! Later it was discovered that she had also killed her first husband and had poisoned her estranged second husband, who became sick after their honeymoon but lived to tell the story.¹⁷

And, finally, to show that women have no monopoly on killing by subterfuge, one must only recall the repeated poisoning of Sandy Coulthard, a 30-year-old mother of 2 whose husband sickened her at home and eventually fed her a lethal dose of arsenic as she lay in a Duke Hospital bed. Most cases are not so sensational, but, as we will show, arsenic has caused much morbidity and mortality among North Carolinians.

**Distribution of cases of arsenic poisoning in North Carolina
seen at Duke University Medical Center, 1965-1998**

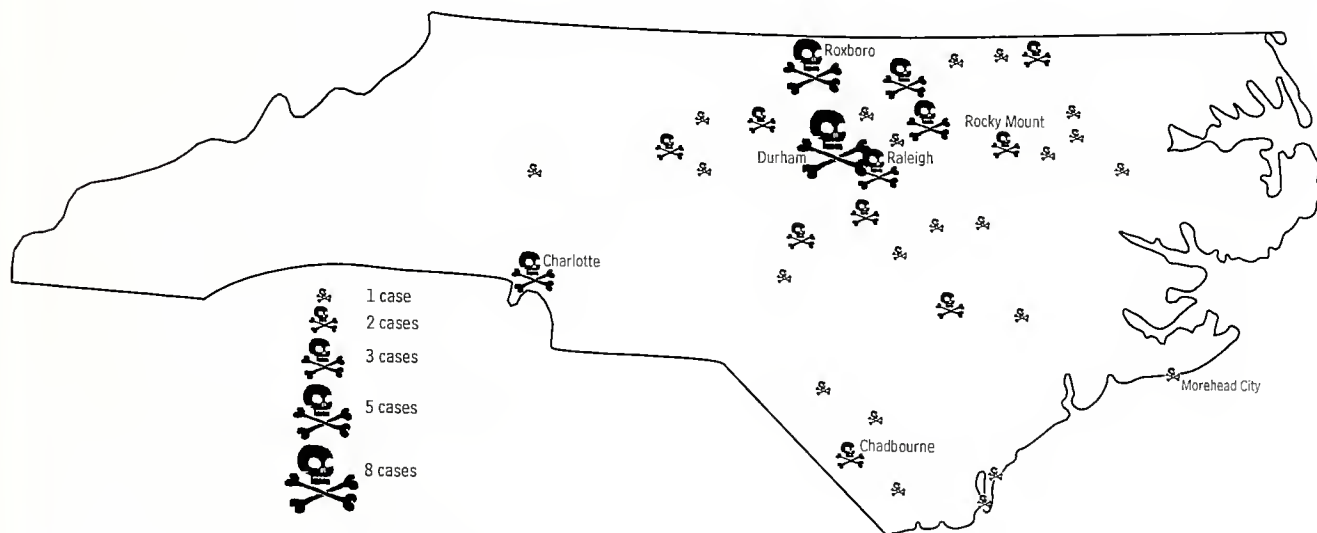


Table 1. Criteria defining arsenic poisoning

Exposure Criteria

Acute: Documented history of arsenic ingestion or
Urine arsenic level >175 mcg/24 hr or
Nails or pubic hair arsenic concentration >150 mcg/100 gm of material.

Chronic: Significant arsenic level in urine, hair or nails (see above), *plus*
Three manifestations of arsenic toxicity (see below), or
Two manifestations and a source of exposure (moonshine, pesticide exposure).

Manifestation Criteria

Acute: Nausea/vomiting; scalding tears; coma; diarrhea; burning throat; hypotension; apprehension; garlic odor on breath; seizure; malaise; cyanosis; tachycardia; dyspnea; delirium; ventricular fibrillation; acute renal failure

Chronic: Anorexia/weight loss; skin rash (hyperkeratosis/hyperpigmentation); Aldrich-Mees lines; sensory or motor peripheral neuropathy; diplopia; prolonged qtc interval on ECG; alopecia; chronic abdominal pain; chronic nausea/vomiting; anemia; basophilic stippling of RBC; increased WBC; eosinophilia; decreased libido; impotence

first major action in the 20th century to remove arsenic from common availability. Its *Special Review of Pesticide Products Containing Inorganic Arsenic* called for strict reduction in the use of inorganic arsenicals because it was realized that arsenic was a Class A Carcinogen, causing lung cancer and skin cancer. In 1988, based on a concern for acute toxicity, the EPA banned virtually all use of inorganic arsenic, except in wood preservatives and a few industrial and agricultural compounds. The EPA proposed removing arsenic acid as a desiccant on cotton, the last agricultural use, and in 1993 all existing stocks of the substance were bought back.²⁰ The only inorganic

Table 2. Epidemiology of arsenic poisoning at Duke University Medical Center, 1965-98

| Years | Number | Acute/ Chronic | Men/Women/ Children | White/Black |
|---------|--------|-------------------|------------------------|-------------|
| 1965-70 | 12 | 5 / 7 | | 5 / 7 |
| 1971-75 | 21 | 9 / 12 | | 9 / 12 |
| 1976-80 | 27 | 2 / 25 | | 21 / 6 |
| 1981-85 | 12 | 2 / 10 | 3 / 9 / 0 | 6 / 6 |
| 1986-90 | 8 | 5 / 3 | | 6 / 2 |
| 1991-98 | 0 | 0 / 0 | 0 / 0 / 0 | 0 / 0 |
| Totals | 80 | 23 / 57 | | 47 / 33 |

arsenicals remaining on the US market are wood preservatives, and insecticides and rodenticides containing arsenic trioxide. Each of these approved uses carries very strict regulations as to how the materials are to be packaged and stored. For example, the rodenticide is approved because the product is solid and dispensed below the ground into mole runs and burrows, therefore posing little risk to other animals and children.

If these new laws and their stringent enforcement are effective, this should be reflected in a marked decrease in the number of cases of acute and chronic arsenic poisoning over the last decade. To see if this is so, as well as to try and understand both the epidemiology and the incidence of arsenic poi-

soning in eastern North Carolina over the last four decades, we reviewed the charts of 166 patients with possible arsenic toxicity presenting to Duke University Medical Center. We present here the results of this evaluation.

Taking Control

Because of arsenic's lethal potential, government agencies have tried to minimize its availability. The first legislation directed to this point, a French law of 1682, was very stringent but ineffective because it contained loopholes that allowed numerous professions to handle the substance.¹⁸ The British Arsenic Act of 1851 required vendors and purchasers to sign their names when buying arsenical substances. It also required that purchase lots of less than 10 pounds be mixed with indigo or soot to discolor the substance, in hopes that this would lessen the number of accidental ingestions and make poisoning more difficult.¹⁹

In 1978, the Environmental Protection Agency took the

Recent Epidemiology of Arsenic Poisoning at Duke

This study was performed at the Duke University Medical Center, a tertiary care academic center in Durham, NC, which also delivers primary care to many of the inhabitants of the surrounding region. The served population consists of a mixture of urban and rural patients from diverse socioeconomic strata.

Table 3. Sources of exposure to arsenic

| Study | Accidental | Intentional* | Moonshine | Occupational | Unknown | Total |
|---------------|------------|--------------|-----------|--------------|----------|-------|
| Fuortes | 6 (32%) | 7 (37%) | 0 (0%) | 0 (0%) | 6 (32%) | 19 |
| Heyman | 4 (10%) | 1 (2%) | 5 (12%) | 7 (17%) | 24 (59%) | 41 |
| Hutton | 7 (41%) | 10 (59%) | 0 (0%) | 0 (0%) | 0 (0%) | 17 |
| Park | 27 (61%) | 13 (30%) | 0 (0%) | 0 (0%) | 4 (9%) | 44 |
| Schoolmeester | 3 (30%) | 1 (10%) | 0 (0%) | 0 (0%) | 6 (60%) | 10 |
| Present study | 1 (14%) | 14 (17%) | 16 (20%) | 7 (9%) | 32 (40%) | 80 |
| Totals | 58 (27%) | 46 (22%) | 21 (10%) | 14 (7%) | 72 (34%) | 211 |

*Suicidal or homicidal ingestion

We reviewed medical records for the period 1965-1998 in an attempt to discover every potential arsenic case. By searching laboratory logbooks and querying the computer database for discharge diagnoses listing this agent, we identified 166 cases of possible arsenic toxicity (see Figure). Twenty-two of the charts were not retrievable for various reasons; the 144 available charts were abstracted by one of the authors.

Because arsenic is a natural substance, some individuals have quite high levels of arsenic in blood or urine. For example, patients who consume large amounts of seafood may excrete up to 200 mcg per day in the urine. Since we were interested only in cases of induced arsenic toxicity, we developed stringent inclusion criteria using arsenic levels in urine or hair and clinical symptoms to define our study population (see Table 1). The arsenic levels we used are higher than those in several other studies but were chosen to exclude questionable cases.

Of the 144 patients, 80 were classified as having either acute or chronic arsenic toxicity by our criteria; another 22 had mildly elevated urine arsenic levels (81-174 mcg) but were excluded from analysis because they exhibited no clinical symptoms to corroborate their potential toxicity. The charts of those who met the criteria were examined to determine age and gender of the patient, size of town of habitation, acuteness of illness, and source of exposure.

Results

The number of patients with clinical arsenic poisoning seen at Duke University Medical Center has decreased dramatically over the past two decades (Table 2), in keeping with our hypothesis about the beneficial effect of restricting arsenic availability. During the period from 1965 to 1970, an average of 4 patients was seen each year; between 1986 and 1990 this number dropped to only 1.6 patients per year, and there were no cases of significant arsenic toxicity between 1990 and 1998.

The typical patient in our study was a white man who suffered chronic accidental exposure to arsenic. The Figure shows the geographic distribution of the cases seen at Duke

during the study period. Overall, 68% of the patients were men, perhaps owing to greater moonshine consumption and more occupational exposure among men. Most of the cases occurred in adults, but 14% of cases were children, almost all of whom had ingested pesticides from under the sink.

Approximately one half of the poisonings occurred in inhabitants of towns with populations less than 10,000; 12 of the 14 cases ascribed to drinking moonshine whiskey occurred in patients from rural areas, as did 8 of 10 accidental child poisonings. Attempted homicides and suicides were evenly distributed between rural and urban settings, as were occupational exposures.

Discussion

The epidemiology of arsenic poisoning has changed dramatically over the past two decades. From a peak of 27 cases in one five-year period (1976-1980), we could find no documented cases at Duke Hospital from 1990 to the present. Importantly, this reduction has occurred despite continued vigilance on the part of physicians in looking for arsenic toxicity in their patients. Thus, the reduction is most likely due to federal regulations, which have decreased arsenic availability.

We found that drinking contaminated moonshine whiskey was the single most common cause of arsenic toxicity, especially during the 1970s. The number of moonshine cases decreased during the 1980s, because of either better "production methods" or decreased consumption of illegal whiskey. Interestingly, the association of moonshine and arsenic poisoning seems to be a North Carolina phenomenon. The only prior report of such an association was Albert Heyman's review of cases at Duke University Medical Center, 1937-1954.²¹ We also found accidental ingestion of arsenic, especially by children, to be quite common, unfortunately. In states with significant rural populations, such as North Carolina, Mississippi, and Iowa, the potential for contact with arsenic-based rodenticides and herbicides appears to have been great. Fortunately, regulatory efforts have virtually eliminated these poisonings.

Despite its reputation, we found arsenic to be involved in only 14 cases of intentional poisoning (suicide or homicide) in our series. This is consistent with other reports (see Table 3 for a summary) showing a cumulative rate of 22% intentional poisonings. Ironically, despite the publicity given to the three murders described earlier, only 2 of our 14 patients died: one as a result of suicidal ingestion and one whose husband delivered arsenic-laced cola to her in the hospital.

Several limitations might have affected the results of this retrospective study. For example, the heavy metal logbooks would have revealed only patients suspected of having arsenic toxicity; the number of undiagnosed patients remains unclear but may be significant. In addition, our criteria may have been too stringent, eliminating some patients who indeed suffered from arsenic intoxication. Few of the sources of exposure were definitely confirmed in the medical record, requiring the authors to make their own judgments (although, as Table 3 shows, our data are consistent with the consensus of earlier reports). Finally, it is possible that the decreased number of recognized cases during 1990-1998 may reflect decreased clinical suspicion of the syndrome. This seems unlikely, since a comparison of the first six months of 1998 to other years showed no decrease in the number of samples sent for arsenic testing.

Fortunately, arsenic poisoning has decreased dramatically at Duke University Medical Center over the past two decades. This is presumably related to regulations enacted by the EPA to restrict inorganic arsenicals. However, in the era of global health and travel, we must remind ourselves that it still needs to be considered in the differential diagnosis of patients with multiple and mysterious symptoms. Arsenic toxicity is no longer commonly encountered in North Carolina, but other areas of the world are still having epidemics related to contaminated ground water, pesticide factory exposures, etc.²² And there are always a few individuals who want to hasten the departure of a "friend" or spouse. Savvy physicians will keep heavy metal intoxication and chronic exposure on their differential diagnosis for a variety of clinical syndromes. □

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Pesticide Poisoning Cases in North Carolina, 1990-1993

A Retrospective Review



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Pesticides are defined by federal law as any substance or mixture of substances intended to destroy, repel, or prevent or mitigate infestation by insects, rodents, nematodes, fungi, weeds, microorganisms, or any other form of life declared to be a pest by the Environmental Protection Agency. The definition includes substances used as plant regulators, defoliants, or desiccants. Herbicides, insecticides, rodenticides, fungicides, disinfectants, wood treatment products, growth regulators, and insect repellants are all considered pesticides.

The general public is justifiably concerned about exposure to the thousands of chemicals licensed for use as pesticides in this country. In 1993 the American Association of Poison Control Centers, which consists of 64 poison control centers and serves approximately 181 million people, reported 1,751,476 poison-related calls.¹ Approximately 70,000 (4%) of these concerned pesticide exposure and included 10 fatal exposures, most due to insecticides. Outpatient or inpatient treatment in health care facilities was needed in from 24% (for insecticide exposures) to 40% (for rodenticide exposures) of cases. In 1996, the Carolinas Poison Center reported 1,613 pesticide-related calls.²

Organophosphate (OP) and carbamate insecticides have largely replaced the more long-lasting chlorinated hydrocarbons such as DDT, chlordane, heptachlor, aldrin, and dieldrin. More than 250 brands of OP insecticides are used in the United States to control structural pests (such as termites), agricultural, household and home garden pests. Life-threatening poisoning is not common, because over the past several decades federal

and state regulatory and educational programs have decreased the incidence of exposure. Still, OPs are involved in accidental ingestions or attempted suicides. Six states with substantial agricultural production (California, Washington, Oregon, South Carolina, Florida, and Texas) have programs to monitor pesticide-related illness and death, and they conduct periodic assessments of morbidity and mortality. Since the 1970s, North Carolina has relied on a voluntary public health system to record pesticide poisoning. A reported case triggers an epidemiological investigation of the circumstances of the exposure, verifies adverse effects, and issues a summary report. But there has been no formal epidemiological assessment of pesticide-related morbidity and mortality in North Carolina since the study by Gehlbach and Williams in 1977.³

The North Carolina Pesticide Law of 1971 created the North Carolina Pesticide Board, a governor-appointed panel representing the state's health, environmental, and agricultural agencies, the agricultural chemical industry, farmers, and the public at large. The Board is responsible for pesticide management and control; it sets rules and regulations, plans environmental and biological monitoring, investigates long-term needs and problems regarding pesticides, and provides professional advice to public and private agencies and citizens.

The North Carolina State Center for Health and Environmental Statistics provided the North Carolina Pesticide Board with numerical data on hospitalizations for pesticide poisoning from 1990 to 1993. The Board then commissioned East Carolina University, North Carolina State University, and the Uni-

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versity of North Carolina at Chapel Hill to carry out a collaborative epidemiological study of these hospitalized cases in order to (1) characterize the circumstances surrounding pesticide poisoning that led to hospitalization; (2) describe the demographic and occupational profiles of those affected; and (3) identify the classes of pesticides involved and the nature of the exposure incidents.

Methods

We reviewed both mortality and hospitalization data. A computerized list of deaths attributed to pesticide poisoning from 1985 to 1994 was obtained from the Office of the Chief Medical Examiner, NC Department of Health and Human Services (NCDHHS). After eliminating 7 duplicate entries caused by admission of the same person to more than one hospital for a single event, a total of 292 non-fatal but hospitalized cases was identified in North Carolina Medical Database Commission records from January 1, 1990, to December 31, 1993. We included all cases discharged from a North Carolina hospital with the following ICD-9 discharge diagnostic codes: 989.2 (chlorinated pesticides), 989.3 (cholinesterase inhibiting pesticides), and/or 989.4 (other pesticides). We excluded pesticide poisonings treated in hospital emergency rooms but not admitted.

Medical records were unavailable in 11 cases, and in 14 poisoning was found not to be due to pesticides. These 25 cases were excluded, leaving 267 study cases, each linked to a medical record at one of 99 hospitals. Three research assistants viewed these records to extract relevant information using a standardized form. No medical information was gathered from other sources. The 1996 North Carolina Agricultural Chemicals Manual⁴ and The Pesticide Manual, A World Compendium⁵ were used to identify chemical names and classes.

Each incident of poisoning was categorized as belonging to one of six mutually exclusive categories or listed as "undeter-

mined." Childhood poisonings were defined as those occurring in persons less than 14 years of age. Adult incidents were listed as intentional or non-intentional, and non-intentional poisonings were further categorized as occurring at home (non-occupational), or at agricultural or non-agricultural work sites (occupational).

We determined the likelihood that the reported pesticide exposure was related to symptomatic illness, based on all information available in the hospital record, including the patient's exposure to pesticides, the clinical and laboratory findings, and the response to treatment. Each case was classified by one author (MS) into one of four categories (Table 1). Several individuals, usually with underlying asthma, reported respiratory tract irritation or wheezing after inhalation of fumes or vapors following pesticide spraying. If there were no nervous system or other systemic effects, these were classified as "unlikely" and the reaction ascribed to the solvent or carrier rather than active pesticide.

Results

From 1985 to 1994, 30 deaths (7 in women and 23 in men) were ascribed to pesticide poisoning; 66% were classified as suicide, 14% as homicide, 17% as undetermined. Several agents caused the deaths, most notably OP (8 cases, or 27%) and arsenical pesticides (5 cases, or 17%). The average age at death was 37 years (range 14-73) in women and 44 years (range 1-82) in men. In 69% of fatal cases the victims were white; in 24% black; and in 7% listed as "other." From 1990 to 1993, there were 7 pesticide fatalities. These cases were not captured in the hospital discharge database because they were dead on arrival. There were 1 accidental toddler death, 3 suicides, 1 homicide, and 2 undetermined cases; most were due to OP poisonings.

Of the 267 hospitalizations occurring from 1990 to 1993, 77 (29%) were the result of accidental exposure in children. Of the 190 adult cases, 97 (36%) were the result of intentional

Table 1. Classification of pesticide poisoning cases

| | |
|-----------------|--|
| Definite | Documented contact with, or ingestion of, pesticide. For OP poisoning, plasma or red blood cell cholinesterase level less than 50% of expected normal values. For rodenticide poisoning, documented evidence of anticoagulant effect. Documented presence of pesticide or pesticide metabolite in blood, urine, or tissue. |
| Probable | Typical clinical findings with appropriate response to empirical treatment. No documentation by laboratory studies, but clear history of access to pesticides. |
| Possible | Clinical findings not typical of pesticide poisoning. Differential diagnosis includes other causes than pesticide poisoning; access to a pesticide product possible but uncertain. |
| Unlikely | Clinical findings not typical; primary diagnosis not pesticide poisoning. Questionable evidence for contact with pesticide product. |

Table 2. Hospitalized pesticide poisoning cases in North Carolina by incident type, 1990-1993

| Incident type | Number of cases | |
|-------------------------------|-----------------|---------------|
| Accidental childhood | 77 | (29%) |
| Intentional adult | 97 | (36%) |
| Non-intentional adult | | |
| Non-occupational | 43 | (16%) |
| Occupational-agricultural | 34 | (13%) |
| Occupational-non-agricultural | 8 | (3%) |
| Undetermined | 8 | (3%) |
| Total | 267 | (100%) |

Table 3. Frequency of pesticide exposures leading to hospitalization in North Carolina, 1990-1993

| Pesticide type | Number of cases | |
|--------------------|-----------------|---------------|
| Insecticide | 84 | (61%) |
| Rodenticide | 56 | (19%) |
| Fungicide | 16 | (5%) |
| Herbicide | 14 | (5%) |
| Multi-purpose | 10 | (3%) |
| Wildlife repellent | 4 | (1%) |
| Unknown | 16 | (6%) |
| Total | 300* | (100%) |

*Some cases exposed to more than one pesticide.

ingestion; 85 (32%) non-intentional; and 8 (3%) undetermined. The adult non-intentional cases were equally divided between occupational and non-occupational exposures. Agricultural exposure accounted for 81% of occupational cases (Table 2).

Several patients were exposed to multiple pesticides at one time, so that there were 300 pesticide exposures among the 267 cases (Table 3). Insecticides accounted for 61% of all expo-

sure, and were found in 80% of non-occupational settings. The majority of insecticide exposures were to organophosphates (60%), followed by pyrethrins. The most common organophosphate agents were Dursban®, diazinon, and malathion (35%, 21%, and 18% of insecticide exposures, respectively). Rodenticides were the second most common exposures, accounting for nearly a third of childhood exposures and intentional adult exposures. These were frequently identified only as "rat poison" or warfarin, precluding more specific identification.

Admission rates were lowest in winter and highest in May and October, consistent with seasonal use of insecticides. By time of day, admissions rose steadily until 9:00 PM then declined.

Childhood Pesticide Poisoning. Among the 77 children admitted for pesticide poisoning, two had been exposed because parental occupation brought the child into contact with the pesticide. Preschool-aged children constituted 96% of all childhood admissions. Although there were almost equal numbers of boys and girls, the boys tended to be slightly older (2.45 v. 1.95 years). Black children were relatively over-represented, constituting 44% of childhood admissions, but only 22% of the 1990 population of North Carolina (Table 4).

Intentional Adult Poisoning. Of 97 cases of intentional poisoning among adults, 95 were classified as attempted suicides and two as attempted homicides. None was fatal. Men made up 61% of admitted cases and tended to be slightly younger (32.5 years) than women (34.7 years).

Non-Intentional, Non-Occupational Adult Poisoning. There were 43 non-intentional, non-occupational adult cases; 20 were caused by exposure during application of pesticides at home. Nineteen cases were attributable to accidental ingestion of a pesticide, usually an OP; 7 people were under the influence of alcohol when this happened. Six ingestions occurred in persons with decreased mental abilities.

Occupational Poisoning-Agricultural. The predominant activity leading to exposure (26 of 34 cases) in agricultural work-related settings was application of pesticides. Hospital record information was not detailed enough to distinguish the specific application activity (mixing, pouring, or spraying). In no instance did hospitalization result from exposure of more than one person at one time.

Occupational Poisoning-Non-Agricultural. There were few non-agricultural occupational exposures; 5 of the 8 incidents involved the handling of pesticides at home supply stores. In

Table 4. Childhood pesticide poisonings in North Carolina by race and age

| Age | White | | Black | | Total |
|-------------|-------------|-------------|-------------|-------------|-----------|
| | Male | Female | Male | Female | |
| 0-2 Years | 14 | 9 | 7 | 14 | 44 (57%) |
| >2-5 Years | 12 | 6 | 6 | 6 | 30 (39%) |
| >5-14 Years | 1 | 1 | 1 | 0 | 3 (4%) |
| All ages | 27 (35%) | 16 (21%) | 14 (18%) | 20 (26%) | 77 (100%) |

Table 5. Likelihood that pesticide exposure caused symptoms

| | Children | | Adults | | |
|-----------------|----------|-------------|--------------|--------------|------------------|
| | | Intentional | Occupational | Agricultural | Non-agricultural |
| Definite | 14 (18%) | 22 (23%) | 8 (19%) | 6 (18%) | 0 |
| Probable | 31 (40%) | 33 (34%) | 16 (37%) | 13 (38%) | 2 (25%) |
| Possible | 24 (31%) | 36 (37%) | 14 (33%) | 8 (24%) | 6 (62%) |
| Unlikely | 8 (10%) | 6 (6%) | 5 (12%) | 7 (21%) | 1 (13%) |
| Total | 77 | 97 | 43 | 34 | 9 |

two cases, exposure was due to the use of pesticides at work.

Likelihood That Pesticide Exposure Caused Symptoms. The combined categories of "definite" or "probable" association of symptoms with pesticide exposure (Table 5) were applicable to 58% of childhood, 57% of adult intentional, 56% of non-intentional, non-occupational, and 56% of agricultural-occupational cases, but only 25% of non-agricultural-occupational cases. Overall, in 10% of childhood and 13% of adult cases, including 21% of agricultural exposures, symptoms were classified as "unlikely" to be due to pesticide poisoning.

Medical Costs And Hospitalization. The data base contained information on the duration of hospital stay and the hospital costs incurred, but not on billings for physician services or other indirect costs of hospitalization. The data thus do not reflect the total costs of admission.

The average hospitalization lasted 3.3 days and cost \$4435. Childhood poisonings were the least expensive and had the shortest average stay (1.8 days). At the other extreme, intentional adult poisonings lasted an average of 4.5 days and cost nearly \$6500. Exposures to insecticides, herbicides, and multi-purpose pesticides were most expensive, while exposures to rodenticides and wildlife repellents were least expensive. The total direct cost of hospitalization for the 267 cases was \$1,184,000, half of which was associated with intentional exposures in adults.

Discussion

There was an average of 67 hospitalizations for pesticide poisoning and one or two deaths each year from 1990 to 1993. Accidental childhood cases and both intentional and non-intentional adult cases each accounted for approximately one-third of hospitalizations. One-half of the non-intentional adult cases occurred because of occupational exposure and half because of exposure during home use or accidental ingestion. Overall, insecticides proved to be the most common pesticide exposures (61% of the total). Most fatalities were the result of intentional poisoning and insecticide exposure.

Interestingly, in the early 1980s, the State of North Carolina began a program to educate farmers about the dangers of storing pesticides in the well-house, because it led to accidental exposure of children and contamination of wells.⁶ We did not find a single instance of this happening.

Black children appeared to have been hospitalized more often than would be expected from their distribution in the North Carolina population; however, the

agricultural region of eastern North Carolina has more black residents (in some counties 30-50% of the population) and more residents under age 18 than the state as a whole.⁷ These eastern counties also have a higher per capita rate of hospitalization for pesticide poisoning, but we could not calculate race-adjusted, county-specific rates of pesticide exposure or hospitalization from the data.

Only one hospitalized patient was identified as Hispanic. Officially the Hispanic population of North Carolina is now 150,000 and was 76,000 in 1990.⁷ Hispanics, who often live in substandard housing, make up a major segment of the migrant farm labor force. They may be underrepresented in hospitalizations, but we could not determine whether ethnicity was not properly recorded or Hispanics did not use emergency departments. A recent study of 120 Hispanic migrant workers at a community health center found 13 with very low levels of cholinesterase activity, indicating OP poisoning.⁸ However, chronic, gradual suppression of cholinesterase levels may not produce symptoms or lead to hospital admission.

The factors that lead to hospitalization rather than outpatient treatment are not clearly defined. Our data suggest that the threshold for admitting children for observation may be lower than for adults, accounting for the shorter stays of children. Overall, supportive treatment predominated. Relatively few insecticide-exposed patients received atropine or other specific therapy. In very few cases was pesticide exposure verified by measurements of levels in body fluids. In a few insecticide-exposed cases cholinesterase levels were drawn, and in a minority of rodenticide-exposed cases coagulation studies were performed.

We found that 46% of cases described as being hospitalized for pesticide poisoning had a relatively low likelihood of true poisoning; we designated 33% of cases as "possible" and 13% as "unlikely." These numbers have significant implications for public health policy and resource allocation, because they imply that in nearly half of cases symptoms are only weakly linked to the putative cause. Clinicians can play an important role in defining the etiology of such cases by obtaining appropriate laboratory tests to verify the suspected diagnosis.

Our results can be compared with those from South Caro-

lina, which has been engaged in physician-based surveys of pesticide poisonings since 1970.⁹⁻¹² After adjusting for population size, hospitalizations for pesticide poisonings were 35% lower in North Carolina, but in both states insecticide exposure accounted for nearly 60% of cases. A greater percentage of admissions in South Carolina was due to OP insecticides (55% vs 37%), but diazinon, Dursban®, and malathion were the most common of these in both states.

Because we focused on hospitalizations, we cannot estimate the extent of less serious poisonings. Nevertheless, it is likely that the number of pesticide exposures exceeds the number of hospitalizations. In 1973-74 the Pittsburgh Poison Control Center reported a ratio of 28 incidents for every hospitalization,¹³ and in 1990 they further reported that for some types of poisonings (including pesticides) treatment was provided in hospital emergency departments but cases were not reported to the Center.¹⁴ In California, only 36 of 1507 reported cases (2%) were hospitalized, although in 26% of cases there was lost work time.¹⁵

Conclusions

Strategies for prevention of pesticide poisoning should be tailored to the populations at risk. The very young average age (2 years) of our childhood cases highlights the need for careful storage and use of pesticides in households with infants and toddlers. Non-intentional, non-occupational adult cases include a number of instances of inadvertent ingestion which, like many childhood cases, could be affected by education about appropriate storage and labeling. Suicide attempts will be difficult to address, because of the use of multiple agents and the potential for substitution of other poisons when pesticides are not available. Adult occupational exposures are most amenable to training of specified pesticide users, but most cases occur among the general populace.

Hospitalization (and death) due to accidental pesticide poisoning is not very frequent in North Carolina, but this should not keep us from developing surveillance and intervention strategies. State and federal regulations and public health-oriented intervention programs have all been very successful. The most toxic pesticides (aldrin, ethyl parathion, arsenic trioxide) have been removed from use. In North Carolina, from 1971 to 1974, there were 9 pesticide-related deaths in children (4 from OPs), and 10 hospitalized children became comatose.³ In the present study, one child died and none became comatose.

It has been suggested that North Carolina require mandatory reporting of pesticide poisoning and develop active surveillance of pesticide-related morbidity and mortality. A 1988 survey showed that 16 states required reporting of occupation-related pesticide poisonings and several also required reporting of environment-related exposures.¹⁶ California and New York require physicians to report pesticide poisonings within 24-48 hours so that immediate public health investigations can occur. In November 1994, the North Carolina Department of Environ-

ment, Health, and Natural Resources (NCDEHNR) endorsed mandatory reporting of pesticide poisonings. In May 1995, the NC Pesticide Advisory Committee recommended a mandatory reporting system be implemented, and, in February 1996, the NC Pesticide Board unanimously endorsed its development. Although the General Assembly did not fund these proposals, physicians can still improve the quality of care and the gathering of future statistics through better documentation of exposure and appropriate analysis of blood and other body fluids in suspected poisoning cases. □

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Clinical Notes: Pesticides and Biomarkers of Poisoning

Early and correct diagnosis and treatment can save lives; physicians must remain vigilant in looking for the clinical manifestations of organophosphate (OP) and carbamate poisoning.^{17,18} The pathophysiology, diagnosis, grading, treatment, and complications of pesticide poisoning are reviewed in detail elsewhere.¹⁷⁻¹⁹ Treatment is generally supportive except in cases of OP or carbamate poisoning for which atropine, or the newer agent glycopyrrolate, is a specific antidote.¹⁷

OPs cause irreversible inhibition of acetylcholinesterase. As a result, they require repeated dosing with atropine for up to 24 hours. Pralidoxime given in the first 24 to 48 hours helps reactivate the enzyme and hasten recovery. OP poisoning can affect the peripheral (causing muscle fasciculations) or central nervous system (causing depressed sensorium). It has both muscarinic and nicotinic autonomic effects (see Table). Miosis is the most consistent physical examination finding, and muscle fasciculations are the most specific.¹⁷ Increased mucosal secretion completes the clinical picture, leading to the mnemonic DUMBELS syndrome (for Diarrhea, Urination, Miosis, Bronchospasm, Emesis, Lacrimation and Salivation). Symptoms usually develop within 4 hours of exposure, but may not appear for up to 12 hours.

Carbamate insecticides (such as carbaryl) are reversible inhibitors of cholinesterase. Cholinesterase activity spontaneously regenerates in 1 to 4 hours. Carbamates can cause DUMBELS, but do not affect the central nervous system. Atropine may be used, but oximes are unnecessary and can actually delay recovery.

Cholinesterase activity can be measured in red blood cells (true cholinesterase) or in serum (pseudocholinesterase). Serum cholinesterase is more labile and less predictive of activity in the nervous

system. It can be depressed by factors such as infection, alcoholism, or liver disease, and it can regenerate quickly. True cholinesterase in red blood cells is the same enzyme found in the nervous system; its level more accurately reflects biological activity at the synapse. Regeneration of true cholinesterase occurs slowly after OP exposure (1% return per day). Measured levels that are 75 to 50% of normal are generally regarded as evidence of toxicity, although symptoms may be absent even when levels are as low as 50%. The development of symptoms is related to *both* the rate of decline and the absolute level of enzyme activity.

In cases of insecticide exposure, both serum and red blood cell cholinesterase levels should be measured immediately, before treatment. Results are rarely available to guide therapy, but they can document exposure to OP or carbamate insecticides and can be used to prevent recurrences.

Exposure Assessment for Other Pesticides. Biological evidence of recent exposure to most pesticides, including herbicides and fungicides, can be obtained by analysis of urine as long as 48 hours after suspected exposure. For selected agents, (such as lindane or paraquat) blood tests can be used.²⁰ A toxicology text should be consulted regarding the appropriate specimen for detecting the agent of interest.

In addition to biologic tests, diagnosis may be facilitated by tests for pesticide residue in foliage; analysis of air, water, and soil; direct testing of suspected products; or tests of patient's clothing and equipment. Such testing may not affect clinical treatment during hospitalization, but it can be critical for assessing causation and for preventive interventions.

Symptoms and signs of cholinergic receptor overactivity caused by acute organophosphate poisoning

| | | | | |
|----------------------------|---|--|---|--|
| Muscarine Receptors | <i>Gastrointestinal</i> Salivation Nausea Vomiting Abdominal pain Diarrhea Tenesmus Fecal incontinence | <i>Cardiovascular</i> Bradycardia Hypotension | <i>Respiratory</i> Bronchorrhea Wheezing Cough | <i>Eye</i> Miosis (may be unequal) Lacrimation |
| Nicotinic Receptors | <i>Musculoskeletal</i> Fasciculations Weakness Paralysis Cramps | <i>Cardiovascular</i> Tachycardia Hypertension | | |
| Central Receptors | Altered consciousness* Seizures Respiratory depression Cheyne-Stokes respiration | | | |

*Abnormalities range from slight confusion to stupor and coma. Adapted from Bardin PG, vanEeden SF, Moolman JA, et al.¹⁸

Center for Child and Family Health-North Carolina

What Is It? And Why?

Thomas E. Frothingham, MD, Matthew S. Epstein, JD, LLM, Cheryl Amana, JD, LLM, Lisa Amaya-Jackson, MD, MPH, Janis Ernst, JD, Desmond K. Runyan, MD, DrPH

Child abuse is extraordinarily common. It causes severe, chronic morbidity, and it is propagated from perpetrator to victim. However, despite its prevalence, the vast majority of cases of child abuse go undetected. Furthermore, we have little information about the effectiveness of intervention. Prevention efforts are promising but only in their infancy. And, paradoxically, prevention and early intervention do not fall within the jurisdiction of the agencies charged with responding to the problem.

It seems clear that new methods for detecting, intervening with, and preventing child abuse must be developed, tested, and taught to health care workers and others involved with the current epidemic of child maltreatment. The Center for Child and Family Health-North Carolina is an outgrowth of community and university planning to cope with child abuse and other traumas. The Center's mission is to facilitate university and community collaboration to (1) respond to the acute medical and mental health needs of traumatized children; (2) develop and test new ways to treat and prevent child abuse; and (3) provide family support.

Frequency and Consequences of Child Abuse

Child abuse and neglect are among the most common threats to child well-being. Two studies have used methods that do not depend on existing reporting procedures to assess the magni-

tude of the problem. The third National Incidence Study of Child Abuse and Neglect surveyed selected counties and extrapolated the findings to the nation.¹ This study found 18.2 cases of physical, sexual and emotional abuse by caretakers per thousand children in 1993. When neglect was added, the rate rose to 41.9 cases /1000 children or 4.2% of the child population. The incidence of sexual abuse reported in the same survey was 4.5/1000 children. Comparison of the 1993 results to data collected similarly in 1986 found that the rate of severe abuse had doubled in seven years.

In a Gallup Poll survey of random households,² telephone reports by parents showed that severe assault alone affected 49 of every 1000 children (nearly three times the rate reported by the National Incidence Study in 1993). The yearly rate for sexual abuse was 19/1000 children, much higher than the rate found in the National Incidence Study, probably because cases counted were not restricted to abuse perpetrated by caretakers.

Statutory definitions are a key factor in significant undercounting of child maltreatment. The definition of "abuse" used by social service and other agencies is limited to maltreatment perpetrated by "caretakers" (defined as parents or people serving as parents in the child's home). Thus, maltreatment by schoolteachers, scoutmasters, coaches, siblings, and other nonparental adults is not counted as "abuse." Social services may substantiate neglect against parents for exposing a child to a perpetrator. In such cases, the agency gets involved with the family, but the cases appear in statistics as "neglect" rather than "abuse." In other words, for social services to be involved, an identified caretaker must be suspected of either abuse or neglect. The omission of noncaretakers is especially problematic in the case of sexual abuse because so many perpetrators are known to the child but are not caretakers.

Using the National Incidence Study rates, we would expect approximately 29,000 North Carolina children to be abused by

The authors constitute the Operations Committee of the Center for Child and Family Health-North Carolina, a collaborative endeavor of Duke University, North Carolina Central University, and The University of North Carolina.

caretakers each year (of whom 7200 would be sexually abused). State statistics tabulate only abuse and neglect by caretakers reported to and "substantiated" by county social service departments.³ In 1994-95 abuse was substantiated for only 3178 North Carolina children, of whom 1591 were sexually abused—an extraordinary undercount contributing to the woefully inadequate allocation of resources to cope with this major health problem. As can be seen in the 1995 statistics for Durham County (Table 1), detection rates are equally low at a local level.

Lifetime prevalence studies ask adults about abuse in their own childhood. These studies record wide variation, but one recent study found a history of "severe physical abuse" for 11% of males and 9% of females; and "severe sexual abuse" for 4% of males and 11% of females.⁴

The health consequences of childhood abuse are well known and repeatedly documented in the professional and general literature.^{5,6} There are debilitating psychosocial symptoms, educational and occupational difficulties, substance abuse, inappropriate pregnancy, aggression, and criminal activity. Most disturbing is the recognition that the abused are prone to aggression and often become abusers of the next generation. Emerging evidence links child abuse to adult suicide, substance abuse, depression, and heart disease.⁶ Most of what we know now derives from retrospective studies, but prospective studies now in progress will give a more accurate picture of the proportion of abused children who develop severe, chronic disabilities in their future.⁷ It is clear that child abuse is a major, if not the major, source of childhood morbidity. It carries over into adult life and on to the next generation. The extent of the problem is to a great extent hidden because of the limited statistics available.

Our Flawed Response to the Problem

Our present approach is to spend large amounts of money on the consequences of abuse rather than on prevention, early detec-

tion, and multidisciplinary intervention. We fund social services, we incarcerate delinquents and felons, we admit children and adults to psychiatric hospitals, we fund substance abuse programs and provide welfare services.

Just what percent of children who have been maltreated receive services or are protected from further maltreatment is not known, but it is likely to be only a small fraction. When medical, mental health, and legal professionals engage collaboratively in dealing with abuse the proportion of cases receiving attention rises substantially, but it is still inadequate, as shown by the results of improved collaborative exchange of information and opinion between agencies in Durham between 1992 and 1995 (Table 2). No matter how willing and able the professional personnel, each system or agency has policy and statutory limitations that impede appropriate action. In addition to the abuse itself, moreover, even the legitimate responsive actions of medical, social services, and law enforcement personnel can have traumatic and disruptive aspects.

Departments of Social Services (DSSs) are designed to intervene only when the behavior of parents falls so far below minimal standards that the State can override the Constitutional protections parents otherwise enjoy; the State then stays involved only until minimal parental standards are met. Furthermore, DSS has no jurisdiction when the perpetrator is not a primary caretaker, and—as long as the child is not in immediate danger—DSS has no jurisdiction in cases where parents are unable to bond with or nurture their child. DSS is not available to families who want help but have not abused or neglected their children; it must withdraw from helping to heal the wounds once minimal standards have been met. DSS is not designed for prevention or early intervention.

The criminal justice system rarely comes into play because of the difficulty meeting the burden of proof beyond reasonable doubt when children, particularly sexually abused children, are the primary witnesses. When perpetrators can be convicted, other children may be protected by segregating the wrongdoer, but harm to the child-victim has already occurred. It is beyond

Table 1. Recorded and estimated cases of sexual abuse in Durham County, 1995

| Source of estimate | Number |
|---|--------|
| "Substantiated" by Department of Social Services; recorded in State statistics ³ | 30* |
| "Definite" determined by Durham medical experts† | 70 |
| "Highly suspect" determined by Durham medical experts† | 70 |
| Estimated from 1993 National Incidence Study ¹ | 214* |
| Estimated from national Gallup Poll, 1995 ² | 900 |

*Only cases perpetrated by "caretakers" are counted.

†From the unpublished records of the Duke Child Protection Team.

the province of law enforcement to address that harm.

The number of mental health professionals expert in trauma treatment is growing, but they are still relatively rare. Child victims of abuse may manifest psychiatric symptoms responsive to specific trauma treatment strategies, but therapists are often bound by a mental health service system focused on treating mental disorders and are thus less able to address problems created by family dysfunction, parental deficits, or ongoing traumatization. Furthermore, such systems do not provide for key prevention tactics during the early years when the harm resulting from deficits in bonding, nurturing, parenting, and protecting occur. We estimate that 60-70% of the psychiatric morbidity may arise from such deficits, yet our current system precludes intervention until diagnostic criteria are met.

A great problem is that agencies and professionals work in isolation, do not understand one another's mandates or vocabularies, and are restricted in their cooperation by real and imagined rules of confidentiality. All too often they must withdraw from involvement because they cannot find the necessary evidence. This leaves the victim(s) at risk of retribution and continuing abuse at the hands of an angry family.

Key to the whole issue of child abuse, from prevention to treatment, is a nurturing, non-offending caretaker who can and will commit to the child's welfare.⁸ In abusive families, parent-figures often have been victims themselves and together with the child are caught in the net of family secrecy, shame, intimidation, and fear. Perpetrators prey on the most vulnerable—the poor, the young, the socially isolated, the disabled, and those in dysfunctional family environments. To change outcomes, we have to look to universal prevention, early intervention, and approaches that foster positive parenting.

One system is designed to provide the right services at the right time—the public health system. Public health officials now realize that child maltreatment and family violence are true public health issues and must be addressed just like other epidemiological risks. When dealing with disease or unintentional injury, public health has evolved from focusing on treatment to a focus on prevention and health maintenance. We can and should do the same with child maltreatment.

And what about doctors? Medical professionals struggle in child abuse cases for many reasons. They may not wish to become involved in time-consuming, depressing, and poorly rewarded investigative processes in which they have little or no control or understanding. Family issues have been historically discounted as belonging to "social services," or as too time-consuming for even willing practitioners to pursue. Medical centers see such involvement as "charity work" or "good deeds" rather than a meaningful part of their medical mission. Detection of sexual abuse poses special problems. Most medical professionals are not trained in the subtleties of sexual abuse in which physical findings are frequently absent or ambiguous. Adults often discount young children's reports of unbelievably depraved acts such as a grandfather's forcing his four-year-old granddaughter to perform fellatio. Only when medical, mental health, and other health professionals, together with health systems administrators, recognize child abuse as an epidemic disease can we progress from mere treatment toward early intervention to prevention.

During the 1970s, physicians increasingly found themselves facing the question of whether a child had been abused. At Duke, such questions arose about once every two weeks at the beginning of the decade, but came up five times a week ten years later. By the end of the '80s about 500 children were referred each year for medical opinions about the probability of abuse. At first, the referrals concerned only physical abuse. Gradually, the reason for referral shifted until nearly 80% were for questions of sexual abuse. In 1978, a team comprising a physician, physician assistant, and two clinical social workers was created to deal with the case load and educate themselves about a

Developments in North Carolina

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Table 2. Outcomes after diagnosis of sexual abuse in Durham County*

| | 1992 | 1995 |
|---|------|------|
| Cases "substantiated" by Department of Social Services | 15% | 29% |
| Neglect "substantiated" by Department of Social Services | 15% | 21% |
| <i>Guardian ad Litem</i> program involved | 15% | 20% |
| Accessed recommended mental health services (few continued) | 53% | 70% |
| Named perpetrators convicted | 30% | 33% |

* From unpublished survey of records of state and community agencies and the Duke Child Protection Team by Frothingham TE and Sickie-Mabry N.

disorder for which health providers were unprepared. Similar multidisciplinary teams were formed at teaching hospitals in Chapel Hill, Greenville, Greensboro, Winston-Salem, Charlotte, and Asheville. Members of these teams now meet monthly by teleconference. At UNC-Chapel Hill and at Duke, mental health programs were begun to evaluate and treat children suffering abuse and other types of emotional trauma.

Pediatric health professionals at UNC-Chapel Hill carried the matter a step further in 1976 by creating the Child Medical Evaluation Program in collaboration with the State's Division of Social Services. This program provides community-based physicians and mental health professionals across the State with training, reimbursement, and quality control for medical and mental health evaluations in suspected child abuse cases investigated by county child protective service workers.

The increasing awareness of the problem of child abuse, especially sexual abuse, has led to numerous new, nonmedical programs and organizations arising to form a widespread and loosely related societal response. Many so-called Children's Advocacy Centers have formed under the guidelines of the National Network of Children's Advocacy Centers headquartered in Huntsville, AL, and Washington, DC. The North Carolina Chapter of Prevent Child Abuse developed home visitation services based on a model proven effective in Hawaii and elsewhere.⁹ The recent trend toward specific, project-oriented consortia of these organizations portends a powerful impact, especially in the areas of primary prevention and family support. The Guardian ad Litem Program ensures legal support and advocacy for children in juvenile court proceedings initiated by social service departments. In 1991, each county was directed to develop broad-based teams to examine local issues relating to child abuse and child fatalities.

At the state level, a coordinating team was appointed, as was a Child Fatality Task Force, to examine and refine the issues and to identify ways to reduce future child fatalities. The Child Abuse Committee of the NC Pediatric Society provides a forum for exchange of ideas, lobbies for better Medicaid coverage, and has participated in significant legislative initiatives on behalf of abused children. Overall, three trends may be discerned: heightened awareness breeding new organizations, recognition of the strength in collaboration, and defining child maltreatment as a public health problem.

Origins of the Center

The Center for Child and Family Health-North Carolina grew out of dissatisfaction with our present failures and a belief that positive outcomes were possible. In 1993, the Durham-Orange County Medical Society (DOCMS) asked pediatricians at the University of North Carolina and Duke University how the Society might help ameliorate child abuse. Daylong retreats, supported by the DOCMS, were held in June of 1993 and 1994, in collaboration with faculty in law, nursing, and social services

from North Carolina Central University. The retreats were attended by county commissioners, judges, interested private citizens, and professionals from law enforcement, medicine, mental health, social services, and a variety of other public and private agencies serving children and families. After an intensive review of possibilities and opportunities, the attendees defined the goal of establishing a free-standing, "turf-neutral," user-friendly facility in which professionals and volunteers from many groups could develop a new and better societal response to childhood abuse and neglect. For the traumatized child and supportive caretaker, the Center would provide help in a sensitive and comprehensive manner. Of equal importance, the Center would pursue research, test new interventions, and teach the many types of professionals involved in detection and intervention. The Center was seen as having the potential to energize and catalyze new and imaginative collaborative ways to prevent abuse.

A planning group was formed with four representatives from each of the three universities. In December 1994, the group used seed money from the universities to hire an Executive Director, then enlarged its efforts and began developing its program with contributions from The Duke Endowment and two community-based groups, the Chapel Hill Service League and the DOCMS Alliance. In April 1996, the chancellors and presidents of the three universities entered into a permanent consortium agreement and appointed a board of directors. The Center for Child and Family Health-North Carolina opened in November 1996 at 3518 Westgate Drive, Durham, a site accessible to both the Durham and Orange County communities.

The Programs of the Center

The Center opened using personnel from four programs: the UNC Child Medical Evaluation Clinic, the Duke Child Protection Team, the Duke Trauma Treatment team from the Durham Community Guidance Clinic, and the NCCU Family Law Clinic. These were highly qualified professionals who provided outstanding services. Still, they defined themselves by the services they provided. In order to move beyond those definitions, to direct services according to the needs of recipients rather than the capabilities of the professionals, the Center developed in three ways during its first year and a half: adding new programs, integrating and merging services, and working with community agencies toward earlier intervention and primary prevention.

Medical Evaluation. About 60 children are evaluated each month for physical or sexual (mostly sexual) abuse or neglect. Referrals come from medical providers, departments of social services, law enforcement agencies and family members. Many are residents of nearby counties, but a substantial number come long distances across the state. The program's staff—three pediatricians, a nurse practitioner, a clinical social worker, a

doctoral-level psychologist, and a registered nurse with a masters degree in counseling—all have years of experience with child abuse. They obtain a medical history and physical examination and, in most cases, one or more interviews of the child and those who accompany the child to the appointment. Children under the age of three and those with developmental disabilities usually are not interviewed. Where appropriate, interviews are videotaped and may be observed by professionals from involved agencies such as social services or law enforcement.

The Center also offers the state-mandated medical examination for all children going into foster care, many of whom have no primary medical provider and are at high risk for maltreatment. With this service the Center has uncovered a number of problems (such as sexually transmitted diseases) that might otherwise have escaped detection.

Psychosocial Evaluations. Diagnostic interviews in the course of the medical exam are often not sufficient to fully evaluate complicated cases. At the Center, where complicated is the rule rather than the exception, the significance of the gap is readily apparent, particularly when proper choice of intervention requires a comprehensive evaluation of family dynamics and the child's mental status. Referral to an outside evaluator would mean beginning over with another provider at another location, a problem the Center was designed to avoid. So the Center hired a psychologist who specializes in such assessments to develop an on-site capacity in conjunction with existing Center staff.

Mental Health Trauma Treatment Services. Two child psychiatrists, one doctoral level psychologist, three clinical social workers, and a nurse counselor provide treatment for children and adolescents who, in addition to abuse, have been exposed to horrific domestic or community violence (kidnapping, murder, neglect, life threats or family deaths). Most striking is the number of patients who have experienced multiple life traumas. The Center provides individual, group and family empirically-based treatment interventions, tailored to the systems issues of each case. Often we provide in-home services, allowing the therapist to work with the child and caretaker in a realistic environment and using the tools that that specific environment provides. We anticipate expanding in-home services not only to treat traumatized families but also to provide programs to improve parenting in high risk situations.

Psychopharmacology Services. When indicated, we augment the above psychosocial treatments with medication. Target disorders for drug intervention include major depression, posttraumatic stress disorder, anxiety, juvenile mania, attention-deficit hyperactivity, and marked aggression. Both patients and therapists are more satisfied since we integrated this service and ended the fragmentation and disruption caused by sending children for medication treatment elsewhere.

Family and Legal Support Program. Families coming to the Center suffer many stresses, including those related to the legal system. Poverty, domestic violence, lack of transporta-

tion, lack of housing, domestic legal problems including custodial disputes, and the inability to navigate the complex maze of available services often prevent families from benefiting from the services that are available. Family members often cannot provide the love and protection so vital to the healthy development of children because they are unable to cope with their own personal issues. To address these problems the family support program, funded in part by Durham's Partnership for Children and the Governor's Crime Commission, is staffed by a lawyer, nurse, social worker, law student interns, and case coordinator. A legal clinic staffed by students from NCCU, Duke, and UNC law schools provides legal information to Center clients during regular medical appointment hours. North Carolina Central University Law School alumni provide actual representation pro bono to families in need of such service.

Because children of dysfunctional parents are often raised by grandparents who then face all the obstacles of child rearing coupled with the burdens of aging, the Center has developed a program offering support group meetings for grandparents and regularly scheduled outings for the children to give grandparents much-needed respite.

Merger. In collaboration with Child and Parent Support Services, Inc. (CAPPS), a private parent training and education agency in Durham, the Center initiated a program for parents needing help with parenting skills. That program, and the relationship, proved so successful that the Center and CAPSS are now in the process of merger. Other CAPSS programs, along with Healthy Families Durham, an intensive home visiting service for high-risk parents funded by Durham's Partnership for Children, are now integral parts of the Center.

Volunteer Program. When virtually every service provided is either uncompensated or under-compensated, the use of paid staff is severely limited. Volunteer staff can be effective, but they must be carefully trained, supervised, and supported. The support and guidance of the Orange County Rape Crisis Center allowed the Center to hire a volunteer coordinator and develop an extensive and comprehensive training program. More than sixty volunteers have been trained and integrated into various Center programs. Volunteers have been especially helpful in supervising the areas where children (often overactive and disturbed) must wait while their parents or caretakers are in conference with Center professionals. Volunteers' insightful observations of family interactions are valuable to examiners and therapists. Volunteers are also a growing force in our grandparent support and parent training activities.

Teaching and Research. A number of "learners" from the three universities spend varying periods at the Center, participating in its several programs. There are pediatric and medicine/pediatric residents, nursing and law students, psychology and psychiatry fellows, social work interns, and professionals from the community on "mini-residencies." Center staff serve as faculty and speakers at local, state, and national meetings, and provide regular instruction to child protective service workers, hospital-based professionals, and the judiciary.

The research activities of Center staff include a study of behaviors of children following exposure to violence and trauma, and the development of ways to measure violence exposure and subsequent symptoms. Outcome studies of cognitive-behavioral and psychopharmacological interventions investigate state-of-the-art treatments for traumatized children. Mental health faculty investigate the effects of post-traumatic stress in parents on their children and on their family's function. Center staff are coordinating a 20-year, national, prospective study of children who have experienced various degrees of maltreatment.⁸ Mental health staff have pilot-tested some of the instruments used for data collection in this unique study. Finally, Center staff participate in a national study of the child welfare system.

Merging and Integrating Programs

The driving force behind the creation of the Center was the belief that children and families would benefit from comprehensive, integrated service programs that minimize fragmentation and family stress. Full integration takes time, energy and a willingness to take risks and step outside discipline boundaries. Referral and consultation are made easier when they occur at a single site. Integration of effort is helped by having consultants available on call, by multidisciplinary case conferences, and by the introduction of service components from one discipline into the services provided by another. For example, the use of mental health assessment tools during the medical examination improves the quality of the medical evaluation and eases the process of referral.

The family in crisis, and the referring person as well, may not be able to decide just what services are needed or in what sequence. At the Center, specified persons take all intake calls and consult with Center staff as needed to decide how cases should be handled. The family in crisis might need legal or public agency help before medical or mental health evaluations are appropriate. Unified intake and multidisciplinary case conferences educate Center staff as to each other's capabilities. As a result, service is tailored to needs in as rational and convenient manner as possible.

Traditionally, each discipline has developed its own ways to assess, make plans for, and deliver its particular service. At the Center we are developing ways to funnel various assessment conclusions into a single multi-disciplinary plan development process. The merged case plan will specify what is to be provided, when it is to be delivered, and by whom. The Family Support and Case Management components will help families gain access to service outside the Center and make sure these services are coordinated with those provided by Center staff; they will also incorporate and assign responsibility for tracking, coordination, and evaluation.

It is in service delivery that we expect the Center design to really make a difference. Discrete, narrowly defined interven-

tions may succeed with discrete, narrowly defined problems. But when a family is under severe stress, when there is a history of trauma and dysfunction, when there is no meaningful support system in place, a more comprehensive, systemic response is required. The Center is developing such a service delivery system, comprising multiple components both in and outside the Center, able to address the entire breadth of problems simultaneously and intensively.

Community Collaborations and the Future

The Center recognizes its role in encouraging state and local organizations to develop new approaches to the pervasive problem of child maltreatment. That role ranges from providing meeting space to interested groups to participating in the development and testing of new, collaborative, preventive measures. In the long run this will be the Center's most significant contribution. Prevention, the ultimate goal, starts with strengthening and supporting healthy parenting. Where that fails or where problems occur despite healthy parenting, we need detection and intervention to stop further abuse and treatment to heal the wounds. After providing protection for the child, the most effective and long-lasting intervention is to strengthen and support committed caretakers in their efforts to create protective and nurturing environments. The following are brief summaries of the directions in which the Center is moving.

Child Abuse Multi-Agency Review Team (CAMART).

The team meets weekly at a community site to review Durham county cases and to exchange information in the early stages of investigation, before agency and professional opinions have matured. Attendees include medical, mental health, and family and legal support persons from the Center, and community representatives from public health, schools, social services, police, district attorney's office, and the Guardian ad Litem Program. This conference is important to strengthening the interagency trust, respect, and understanding needed to deal with complex and extraordinarily difficult situations of child maltreatment and family dysfunction. Each child's situation is reviewed and each involved agency's view is heard. From this exchange there emerges a more comprehensive and creative plan of help for the child and family.

Early Intervention and Primary Prevention. There are many opportunities for early intervention and at least one for primary prevention. The statistics on teenage pregnancy are astounding and discouraging. Teenage girls, particularly unmarried teenage girls, are likely to have been traumatized, unlikely to have been adequately parented, unlikely to get adequate prenatal care, less likely to bond with their infants, almost always live in poverty, are poorly equipped to avoid and resist violent perpetrators, and are at risk of substance abuse. They often lose their children to foster care or termination of parental rights. Focused and concentrated attention on trauma-

tized teenage girls from dysfunctional families may prevent high risk pregnancies and help assure that children are born to parents who are capable of and interested in their healthy development.

A child's healthy development depends on parental bonding and nurturing in the early months. Our challenge is to develop the support systems needed and to convince funding agencies of their importance. We are working toward the goal of universal home visiting for new parents. Such programs have been developed and tested elsewhere with encouraging results.⁹ When we do not succeed in preventing problems associated with parental deficits, we need to work closely with health care providers, day-care providers, early education programs, and schools to identify early signs of problems and to intervene at the earliest possible time. Without early intervention, large numbers of children will grow up with significant impairments, at risk of harming themselves and others and perpetuating the cycle in future generations.

A Work in Progress. The Center is launched and secure in its basic reason for being, the skill and morale of our staff, and our reception in the community. Financial security is growing through revenue from clinical services, grants, gifts, contracts, and contributions from the parent universities. The correct balance of service and the development and testing of new and urgently needed treatments are in sight. We are on our way to pushing some light into the darkest corner of our culture, and to alleviating and preventing the major health problem of our youth. □

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A Less Than Pacific Odyssey: The Use of Kava



Ronald B. Mack, MD

The Pacific ocean was discovered by Vasco Balboa and named by Ferdinand Magellan. My one trip on that allegedly tranquil sea lasted six months and was not especially tranquil. In the summer of 1946, the island of Oahu in the Hawaiian Islands was beautiful, but the sight of the USS Arizona, rising in its crippled state out of waters at the US Naval Base at Pearl Harbor (there was no memorial at that time), was awesome. The thought of the men still in the water under the ship was a chilling reminder of how lucky many of us were.

We left the Sandwich Islands for the Marshall Islands, bringing supplies to the ships of Joint Task Force I, which was taking part in the atomic bomb tests at Bikini Atoll. We did not know that the native inhabitants of the myriad Pacific islands were at the same time assuaging their anxieties with kava (and had been doing so for centuries). Had we known, we could have gathered some ourselves to calm our fears, but the islands were too radioactive for us to spend much time on land.

Westerners first learned of the kava plant from the writings of the great British explorer, Captain James Cook, who observed that native girls in Polynesia chewed the roots of the kava plant into a pulp and spit the concoction into coconut milk. The mixture was strained through fibers, put into a communal bowl, and distributed to the tribe. Ick!! Cook's crew demurred.¹

Kava (*Piper methysticum*) is a member of the pepper family, *Piperaceae*. It has been consumed by members of a vast number of Pacific Ocean cultures, from the coastal areas of the large Melanesian island of New Guinea in the western Pacific to the Polynesian Hawaiian Islands.² Although many inhabitants of these far-flung islands have abandoned its use, many others still use it for traditional functions. It is of historical interest that the ingestion of kava has been used to trace the migrations of Oceanic peoples; that it is sometimes consumed as a religious act; that it may be used to facilitate social intercourse; and that some newly independent, and less than wealthy, Pacific Island nations see it as a very valuable cash crop for export.

What's In a Cup of Kava?

So what, after all, is this psychoactive beverage that has been used ceremonially for thousands of years? It is essentially a nonfermented depressant and mood elevator with complex neuropharmacologic properties. It induces a tranquil state of intoxication.³ More than just a cultural oddity viewed from afar, however, it is also a popular item in your local health food store, taken primarily to relieve anxiety, stress, restlessness, and insomnia.⁴ Its use in this country has increased remarkably, particularly since 1996 when several herbal-product makers led a successful campaign to bring it to our country. Our fellow citizens, many of whom are searching for a quick, stress-reducing fix, embraced this lowly root as the doorway to Nirvana.

Americans have come to this plant rather late in its history. There is evidence that Pacific island natives have been fond of it for 3000 years.⁵ In the 1760s, the above-mentioned Captain Cook described the ceremonial use of kava, "an intoxicating beverage." J. G. Forster gave us the first detailed description of the plant in 1777, and he also gave it its Latin name (literally, "intoxicating pepper"). Kava thrives in the humid, tropical climates surrounding the Pacific Ocean. It is a lush, leafy, green plant, which grows to a height of 7-8 feet and sometimes twice that high. The leaves are heart-shaped, smooth, and shiny, but it is the roots from which the kava beverage is prepared.

Kava's relaxing properties derive from a group of compounds called kavalactones; kava contains six major kavalactones.⁵ Most of the research on kava has focused on the resin, which contains almost all the active fat soluble components (kavalactones or kavapyrones). These are most concentrated in the lateral roots and less so in roots that reach the surface of the ground. The major constituents of kava resin have chemical names that most of us never heard of and some of us cannot pronounce, to wit: kavain, dehydrokavain, methysticin, dehydromethysticine, demethoxyyanogonin and yanogonin.⁶ The plasma elimination half-life of kavain is 2.8-6.7 hours. It takes 1.8-3.0 hours after ingestion to reach peak serum concentration. There is a gas chromatography-mass spectrometry

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method to detect the urinary metabolites of kavalactones.

Modern purveyors of kava tout it as a "natural" product to relieve stress, reduce anxiety, and prevent insomnia. They allege that side effects are uncommon (more about this later in the program), that kava does not cause addiction, is not expensive and, although it relaxes muscles and the emotions, that it sharpens concentration and memory without loss of contact with the environment or reality.

Nature's Valium

To reduce my anxiety in writing about kava, it is gratifying to note that several investigators have speculated on the herb's mechanism of action. The hypothesis is that the central nervous system effects of kavalactones mimic those of benzodiazepines, which produce their pharmacological effects by potentiation of gamma-aminobutyric acid (GABA)-mediated inhibitory neurotransmission. This suggests an interaction of kava with GABA or benzodiazepine receptors.⁷ (In other words, kava looks like nature's Valium.)

You remember GABA. Sure you do!! Identified as a unique chemical constituent of the brain in 1950, it is, in fact, the major inhibitory neurotransmitter in the central nervous system.⁸ It mediates the inhibitory actions of local interneurons in the brain (and maybe also presynaptic neurons in the spinal cord). It also mediates inhibition within the cerebral cortex and between the caudate nucleus and the substantia nigra. GABA receptors are divided into two main types, A and B. The GABA-A receptor protein is present in abundance and has a role in almost every neuronal circuit. This receptor is the site of action of many neuroactive medications, particularly benzodiazepines and barbiturates. For our purposes, we can say that benzodiazepines act directly on GABA-A receptors. The question remains, does kava perform the same biochemical task?

Some interesting experiments conclude that the pharmacological activity of methysticin and its colleagues is not due to direct stimulation of GABA receptors by kavalactones.⁷ Experiments do suggest that kavalactones cause sedation by means of GABA-receptor binding, but by increasing the number of GABA binding sites rather than changing affinity.⁹ A 1994 article in *Psychopharmacology* argues that GABA-A receptors bind drugs such as benzodiazepines and barbiturates to enhance or prolong GABA-A-mediated synaptic inhibition. Thus the anxiolytic-hypnotic action of kava can be explained by its interaction with GABA-A receptors. The authors conclude from rat brain experiments that kavalactone-induced modulation of GABA binding is most evident in the specific brain areas generally considered the target areas of kavalactone action. They further state that the brain tissue concentrations effective in vitro were comparable to those reached after clinically effective doses of kavalactone extract in vivo. This strongly favors the hypothesis that the GABA-A receptor mediates the pharmacological actions of kavalactones. Wow! That is con-

fusing, and I am upset by confusing data. (As we speak, three of my granddaughters are chewing some kava roots for me and are about ready to spit them into a jar of coconut milk so that I may partake and assuage my anxiety.)

Risks of Relaxation

Kava is not entirely without risk. The usual dosage—if there is one—is 60-120 mg of kavalactones.⁴ (The data about dosage comes from the German Commission E, an expert advisory panel equivalent to our FDA.) Acute overdose of kava can cause excess sedation, extrapyramidal movements, ataxia, yellow skin color, and deafness.⁵ There are anecdotal reports of temporary visual abnormalities such as a reduced near point of accommodation and convergence, dilated pupils, and disturbances of oculomotor balance.⁵

Chronic kava use can cause hepatic, ocular and spinal cord damage. Chronic kava drinkers may have a very unhealthy appearance and suffer from malnutrition, shortness of breath and loss of body fat.⁶ Health effects of chronic use depend on amount consumed. Very heavy use means an average of 440 grams per week; heavy use, 310 grams per week; and occasional use, 100 grams week. Very heavy users in a coastal Aboriginal community in Australia¹⁰ were 20% underweight; their levels of gamma-glutamyl transferase were greatly increased; serum albumin, plasma protein, urea, and bilirubin levels were decreased; and, in many, high-density lipoprotein cholesterol levels were increased. Interestingly, Australian Aborigines had no contact with kava until the early 1980s, when they learned about it from missionaries who visited them from Fiji, Tonga, and other kava-growing countries of the South Pacific.¹¹ Kava rapidly became a drug of abuse.

Chronic heavy consumption has been associated with a pellagroid dermatopathy attributed to niacin deficiency. The eruption, which is scaly and ichthyosiform and quite ugly, is probably not due to niacin deficiency since experimental and clinical evidence shows that the rash does not respond to nicotinamide therapy.¹² The condition ameliorates with decreased kava ingestion.

The wonderful, helpful, I can't-do-without, new textbook, *The American Herbal Product Association's Botanical Safety Handbook*,¹¹ suggests that kava not be used by women who are pregnant or nursing, or by patients with endogenous depression. Some authors suggest that simultaneous use with alcohol or barbiturates may potentiate inebriation. In Germany, kava use is limited to 4 weeks to 3 months. Canadian regulations prohibit sale of kava as a non-medicinal agent for oral use. Kava should not be taken by patients who are also taking benzodiazepines because the effects may be additive, leading to coma.

I am perfectly happy to avoid this product entirely and rely instead on a cup of espresso with a sufficient amount of Sambucca to make me believe that American medicine is resorting to sorcery again.

The Perils of Exploration

The three famous explorers associated with the benign and kindly kava plant came to less than kindly ends. Captain James Cook, stalwart explorer, returned to the Sandwich (Hawaiian) Islands, which he helped to discover. He was killed there in 1778 during an altercation with some natives over the theft of a boat. Vasco Balboa sailed from his native Spain in search of an alleged "great sea" on the other side of the Isthmus of Panama. In September 1513, with 190 Spanish soldiers and

1000 Native Americans, he walked through the jungles of Panama to find the Pacific Ocean and name it the Mar del Sur (the South Sea)! Balboa had many enemies, including the governor, Pedrarias, who arrested our hero, convicted him of treason, and had him beheaded. Finally, Ferninand Magellan, who gave the Pacific its present name, landed on the island of Cebu in the Philippines where he and most of his crew were killed. It seems that in none of these deaths were the perpetrators indulging in the calming effects of kava. □

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Mental Stress and Coronary Disease

The Smart-Heart Study

James A. Blumenthal, PhD, Andrew Sherwood, PhD, Michael Babyak, PhD, Rebecca Thurston, BS, Damon Tweedy, MSIII, Anastasia Georgiades, PhD, Elizabeth C.D. Gullette, MS, Parinda Khatri, PhD, Patrick Steffan, PhD, Robert Waugh, MD, Kathleen Light, PhD, Alan Hinderliter, MD

Our understanding of the relationship between stress and coronary artery disease (CAD) has been limited by the infrequent and unpredictable nature of "hard" clinical endpoints like myocardial infarction (MI) and sudden cardiac death (SCD). Although catastrophic events such as earthquakes,¹ war,² and bereavement³ can trigger MI and SCD, such events are rare and do not represent the typical occurrences of daily life. Recently, studies of behavioral and psychosocial influences on myocardial ischemia have provided important insights into how behavior may affect disease activity. These insights have been made possible by a variety of technological advances including ambulatory electrocardiographic (ECG) monitoring systems to detect asymptomatic ST-segment depression, sensitive laboratory measures of left ventricular dysfunction (radionuclide ventriculography and echocardiography) and of myocardial perfusion (positron emission tomography or technetium 99m sestamibi myocardial perfusion (SPECT)). Now, a number of studies have demonstrated myocardial ischemia in up to 40% of patients during activities of daily living, and provoked by mental stress in up to 66% of patients in the laboratory.

In this review we summarize recent findings in the area, discuss therapeutic implications, and describe a new collaborative study, sponsored by the National Institutes of Health, being initiated at Duke University and the University of North Carolina at Chapel Hill.

Drs. Blumenthal, Sherwood, Babyak, Georgiades, Khatri, and Steffan, and Ms. Thurston, Ms. Gullette, and Mr. Tweedy are with the Department of Psychiatry and Behavioral Sciences, Duke University. Dr. Waugh is with the Department of Medicine at Duke (where Dr. Blumenthal and Mr. Tweedy are also affiliated). Drs. Light and Hinderliter are at the University of North Carolina-Chapel Hill, where Dr. Light is with the Departments of Psychiatry and Medicine, and Dr. Hinderliter is with the Department of Medicine.

Stress-Induced Myocardial Ischemia During Daily Life

Exercise treadmill testing (ETT) has been the standard clinical method of assessing myocardial ischemia. It provides important prognostic information over and above conventional risk factor assessment.⁴ Ischemic ST-segment changes detected by ambulatory ECG are predictive of future cardiac events. Gottlieb et al⁵ followed 103 high-risk post-infarction patients for one year. They found that patients with myocardial ischemia on ambulatory ECG (over 90% of episodes were asymptomatic or "silent") had a mortality rate three times that of those not showing ischemia. Recent studies have extended these findings, demonstrating similar results in populations of patients with stable CAD.

Physical activity can be a potent trigger of myocardial ischemia out of hospital, but most ischemic events occur without exercise and at relatively low heart rates compared to ischemia triggered by exercise. Ischemia occurs during a wide variety of physical and mental activities and not just during strenuous exercise. Most ischemia occurring out of hospital is silent (asymptomatic) and manifests a variability over time that cannot be accounted for by changes in the patient's clinical status or fixed coronary obstruction. This suggests a dynamic interaction between patient behaviors (including mental stress) and coronary artery pathology as the source of the variability.

The concurrent use of behavioral diaries and continuous ECG monitoring has been used to examine potential triggers of ischemia. In one of the earliest studies, Schang and Pepine⁶ noted that 75% of episodes of ST-segment depression took place during very light physical activity. Barry et al⁷ extended this observation, finding that increasing intensity levels of mental or physical activity increased the likelihood of transient ST-segment depression. However, because high levels of vigorous exercise were relatively infrequent compared to mental activities, they concluded that the mental activity might be a

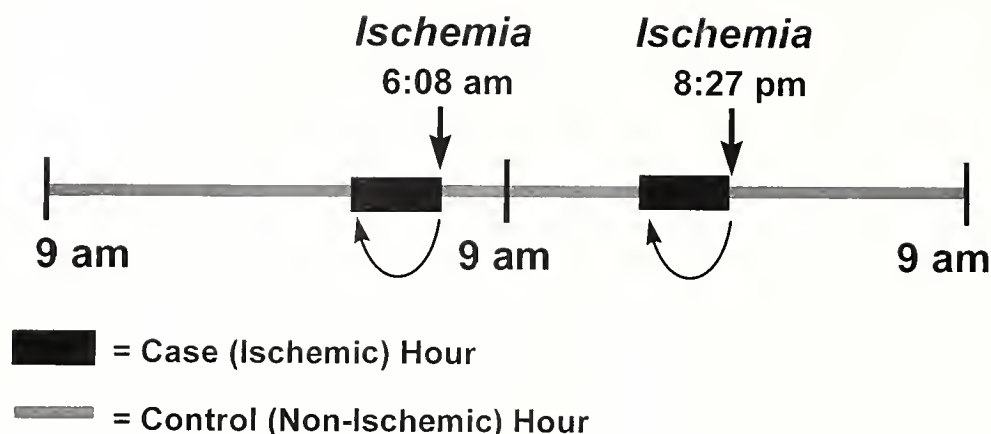


Fig 1: The case crossover design: diary entries from the hour preceding ischemic events (at 6:08 am on the first day of ambulatory ECG monitoring and 8:27pm on the second day) are compared to entries at non-ischemic hours (control hours).

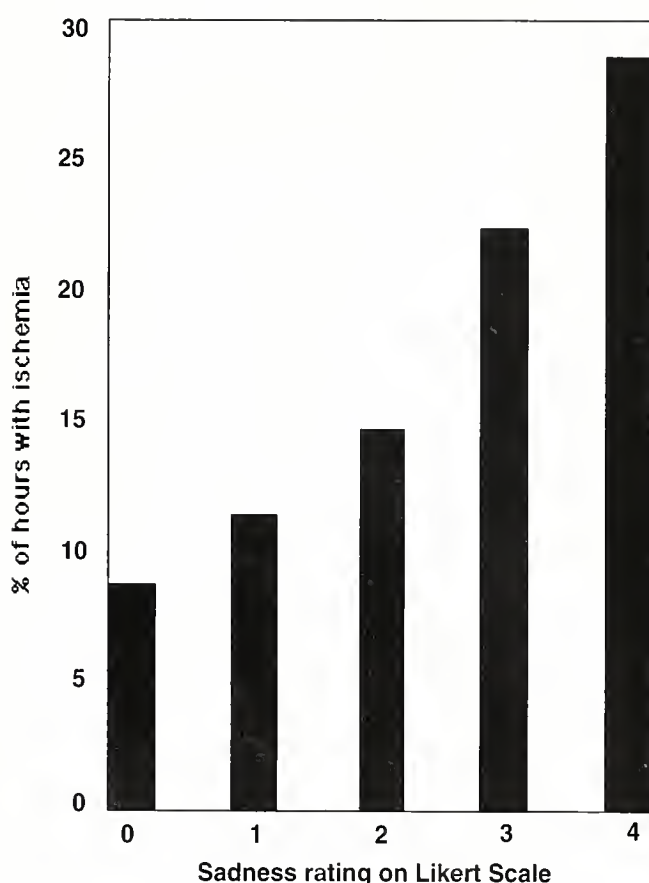


Fig 2: Depression and ischemic activity: each increment in ratings of sadness (on a five-point Likert Scale) is associated with a greater percentage of ischemic hours.

common initiator of transient ischemia. Using a detailed diary to study 63 patients, Gabbay et al⁸ found ischemia to be correlated with strenuous physical activity, low-exertion states

characterized by intense anger, or smoking cigarettes.

A recently completed Duke University study of potential triggers of myocardial ischemia out of hospital compared moods and activities (assessed using a detailed behavioral diary) with 48 hours of continuous ECG monitoring.⁹ A sophisticated data analytic strategy, the "case crossover technique" (see Figure 1), was used to identify specific triggers of ischemic episodes. Fifty-

eight patients with stable CAD and evidence of exercise-induced ischemia were studied. Diary entries in the hour preceding an ischemic event were considered to be "case hours," whereas all other hours or the same hour on the alternate day were considered to be "control" (non-ischemic) hours. Patients were more than twice as likely to have experienced feeling frustrated, tense or sad during the hour preceding an episode of ischemia compared to control hours. For example, there was an incremental risk of ischemia associated with depression (Figure 2). The number of hours in which patients were ischemic increase significantly for each increment in level of reported "sadness." Thus, relatively subtle, negative emotional states appear to be potent triggers of transient myocardial ischemia during daily life.

Stress-Induced Myocardial Ischemia in the Laboratory

Ambulatory studies that rely on the spontaneous and uncontrolled association of daily life stressors to myocardial ischemia have limited capacity to establish causal relationships between mental stress and ischemia. Furthermore, these procedures are not optimal for the study of the pathophysiologic mechanisms involved in stress-induced ischemia, nor is the ECG particularly sensitive at detecting ischemia.

Because exercise testing was the model, initial studies on the role of mental stress used changes in the ST-segment of the ECG to detect myocardial ischemia. For example, Specchia et al¹⁰ found that mental stress could induce such changes in CAD patients, but the prevalence was relatively low (less than 20%) and rarely noted in individuals who did not already have a positive exercise ECG. Recently, investigators have used sensitive noninvasive techniques such as radionuclide ventriculography, positron emission tomography, and two-dimensional echocardiography to evaluate mental stress influences on myo-

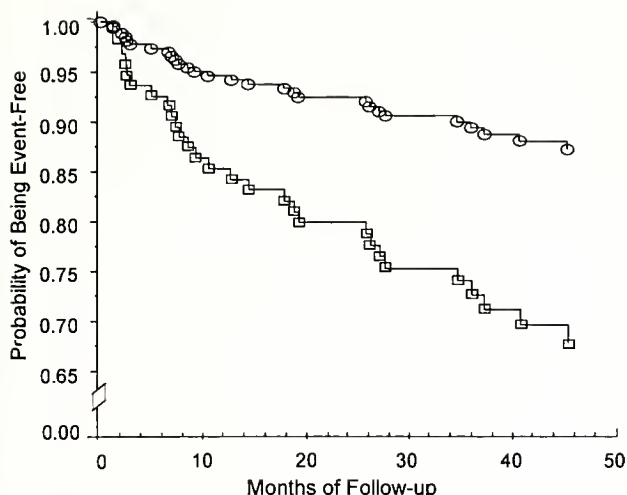


Fig 3: Mental stress-induced ischemia and prognosis: the probability of event-free survival for patients with significant [squares] and non-significant [circles] falls in LVEF during mental stress. Each 1% fall in LVEF is associated with an 8% increase in risk (JAMA 996;275:1654. © American Medical Association).

cardial ischemia. These techniques have demonstrated that experimental mental stress can provoke ischemia as shown by changes in myocardial perfusion, left ventricle ejection fraction (LVEF), and the onset of ventricular wall motion abnormalities in a significant proportion of CAD patients. Rozanski et al¹¹ compared changes in LVEF and wall motion abnormalities induced by acute mental stress to physical exercise in 39 patients with documented coronary disease. Almost two-thirds had wall motion abnormalities during periods of mental stress and one third exhibited LVEF reduction of more than 5%. The magnitude of wall motion abnormalities during mental stress was comparable to that induced by exercise in the same patient.

The Duke group studied 132 CAD patients who underwent 48-hour ambulatory ECG monitoring and radionuclide ventriculography during mental stress testing.¹² Individuals who exhibited new wall motion abnormalities or had greater than 5% LVEF reduction during mental stress were more likely to exhibit ischemia during daily life. In fact, mental stress-induced ischemia was a better predictor of ambulatory ischemia than exercise-induced ischemia. The ischemic episodes were usually asymptomatic and occurred at low heart rates, well below the ischemic thresholds of exercise. Patients who had mental stress-induced ischemia at baseline had a worse prognosis during the ensuing five years. Controlling for age and previous history of MI, patients who exhibited ischemia during at least one mental stress task were more than twice as likely as those who did not demonstrate ischemia to suffer a fatal or non-fatal MI or to undergo a revascularization procedure during the follow-up period (Figure 3). Each 1% drop in LVEF during mental stress was associated with an 8% increase in risk. Moreover, patients with resting LVEFs less than 60% had a more than 8-fold greater risk for an adverse event, compared to those who did not exhibit mental stress-induced ischemia.

Mechanisms of Mental Stress-Induced Myocardial Ischemia

Although the role of mental stress in triggering ischemic episodes is now widely accepted, the triggering mechanism is not fully understood. One conceptual model that we developed recently is presented in Figure 4. Deedwania and Nelson¹³ studied ischemia by simultaneously monitoring ambulatory blood pressure and ECG. They found that hemodynamic changes were consistent precursors of ischemia. Strenuous physical activity raises systolic blood pressure (SBP) and heart rate (HR), suggesting that increased myocardial workload and oxygen demand triggers ischemia. Exposure to mental stress produced similar elevations in SBP, but ischemia occurred at significantly lower heart rates. Blumenthal et al,¹⁴ comparing the hemodynamic responses to mental and exercise stress, showed that mental stress induced ischemia at substantially lower double product (SBP x HR) and higher diastolic blood pressure (DBP) values. This suggests that reduction of myocardial oxygen supply might play a role. The authors suggested

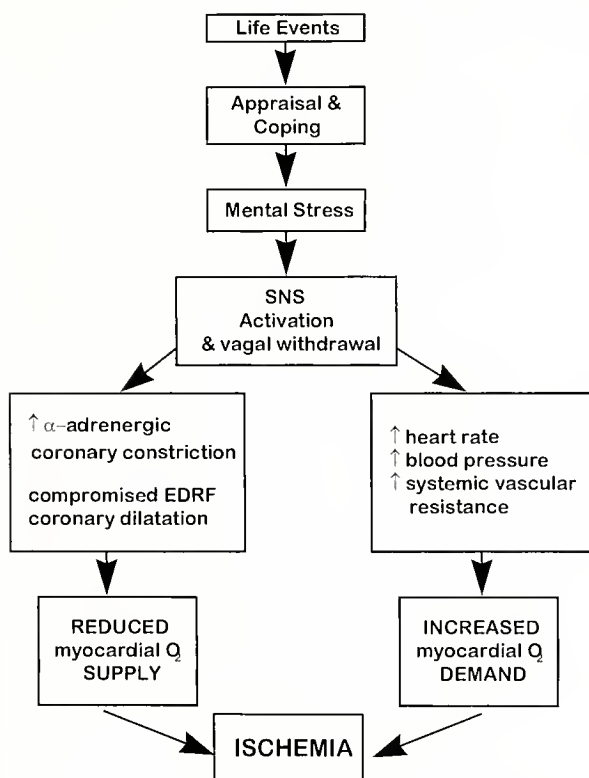


Fig 4: A conceptual model for understanding the role of stress in the occurrence of myocardial ischemia.

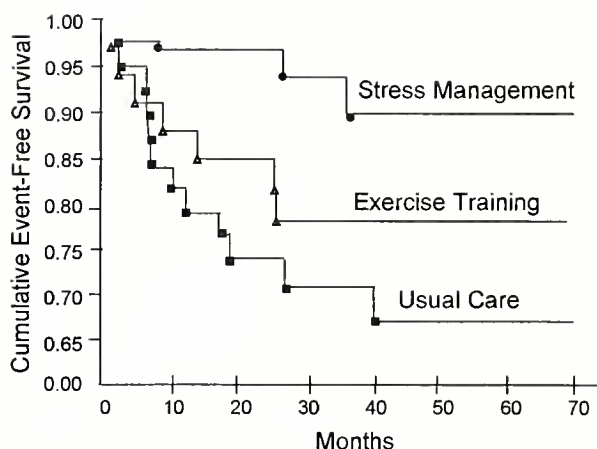


Fig 5: Survival curves for treatment groups: stress management training is associated with a 74% reduction in fatal and non-fatal MI, sudden cardiac death, or coronary revascularization; exercise training is associated with 36% reduction in cardiac events compared to Usual Care Controls (Arch Int Med 1997;157:2218. © 1997, American Medical Association).

that the elevated DBP reflected vasoconstriction of the coronary arteries, with reduced blood flow to the myocardium. Their hypothesis is supported by other studies showing higher levels of DBP during mental stress relative to exercise testing.¹⁵ Recently, the PIMI study¹⁶ reported an inverse relation between LVEF during mental stress and systemic vascular resistance (SVR), suggesting that mental stress increases afterload on the heart or possibly is a marker of coronary vasoconstriction. More definitive studies are required to clarify this point.

The function of vascular endothelium has also emerged as an important consideration in the pathophysiology of mental-stress ischemia. A major product of vascular endothelium is nitric oxide, a fast-acting vasodilator of short duration, which is important in the regulation of coronary blood flow. In healthy individuals, sympathetic nervous system-activated coronary vasoconstriction is countered by endothelium-derived relaxing factors. Atherosclerotic coronary vessels lose their endothelial vasodilatory properties, and sympathetic nervous system-mediated vasoconstrictive influences can predominate. The imbalance may precipitate ischemia in some patients with CAD. Dakak et al¹⁷ found that coronary arteries of patients without significant disease dilated under mentally stressful conditions while the vessels of patients CAD were impaired in their capacity to dilate.

Implications for Therapy

Because behavioral and psychosocial factors play a significant (and independent) role in the development of CAD and its complications, there has been much interest in implementing behavioral treatments to modify the natural course of these clinical events. Behavioral interventions, such as exercise and

stress management training, have been shown to improve the quality of life and potentially to reduce associated morbidity and mortality in CAD patients.

Aerobic exercise training has been widely used for secondary prevention and is the cornerstone of most cardiac rehabilitation programs. Several recent meta-analyses have demonstrated that exercise training reduces the risk of fatal myocardial infarction by 25%, although it does not diminish the risk of non-fatal MI.¹⁸ A similar meta-analysis of psychosocial interventions documented a 40% reduction in mortality and 65% reduction in recurrent coronary events over a two-year follow-up period.¹⁹

A recent Duke study investigated 107 patients with CHD and ischemia documented either by ambulatory ECG or mental stress testing.²⁰ Patients were randomly assigned to a 16-week program of either stress management or exercise training. Individuals who lived too far from the medical center to participate formed a non-random control group. In comparison to controls, patients who underwent stress management showed greater reductions in cardiac wall motion abnormalities during mental stress testing and fewer ischemic episodes during ambulatory monitoring compared to usual care controls; participants who underwent exercise training showed greater reductions in wall motion abnormalities during exercise. Follow-up over an average of 38 months revealed that the stress management affected clinical prognosis, as manifested by a 74% reduction of subsequent cardiac events compared to controls. Exercise training was associated with a 34% reduction in subsequent events, but this effect was not statistically significant (Figure 5).

Smart-Heart: A New Duke/UNC Collaborative Research Study

Recently, the National Heart, Lung, and Blood Institute awarded Duke and UNC a grant to examine the efficacy of treating mental stress-induced myocardial ischemia. The research team is led by Drs. James Blumenthal and Andrew Sherwood (Duke), and Alan Hinderliter and Kathleen Light (UNC). The new study will extend and improve upon prior work by (1) evaluating, in a fully controlled trial, the efficacy of stress management and exercise training in reducing ischemia; (2) examining the biological and behavioral mechanisms by which mental stress triggers ischemia; and (3) determining the mechanisms by which the interventions alter ischemia. We hypothesize that the interventions will reduce ischemia by changing the hemodynamic responses to mental stress, leading to an improved balance between myocardial oxygen supply and demand.

The study proposes to recruit over 200 men and women with stable coronary disease and documented mental stress-induced or ambulatory ischemia. Patients will undergo a variety of assessments at entry and after four months of treatment. In-hospital assessment will include provocative mental stress testing using radionuclide ventriculography to detect myocardial ischemia, ultrasound testing to assess endothelial function,

and psychometric testing to determine relevant psychosocial traits such as job stress, hostility, and depression. Out-of-hospital assessment will include 48-hour ambulatory ECG monitoring, 24-hour blood pressure measurement, and detailed behavioral diaries. Following completion of the assessments, patients will be randomly assigned to one of three groups to receive either 16 weeks of supervised exercise training, stress management training, or patient education/usual care. Annual re-evaluations for up to five years are planned to examine the long term benefits of the interventions. Data from this study will provide new scientific insights into the mechanisms of mental stress-induced myocardial ischemia as well as important knowledge about the clinical benefits of exercise and stress management training in the treatment of patients with CAD. For more information, contact Ms. Rebecca Thurston, Study Coordinator, at (919) 684-3889. □

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Conjoint Report to the North Carolina Medical Society and the North Carolina Commission for Health Services

A. Dennis McBride, MD, MPH

On September 1, 1997, public health services were transferred from the Department of Environment and Natural Resources to the Department of Human Resources, creating the NC Department of Health and Human Services (DHHS). The three divisions of public health services in DHHS (Epidemiology, Women and Children's Health, and Community Health) will be merged into a single Division of Public Health and placed, together with the Division of Mental Health and the Division of Facilities Services, under control of the Assistant Secretary for Health/State Health Director. The Assistant Secretary for Health will inventory the various public health plans within the several health divisions and, over the next year, develop a cohesive and consolidated public health policy.

The reorganization of DHHS has demonstrated the strong connection between public health and the environment. While the State Health Director is programmatically responsible for environmental health policy, the administration of the Division of Environmental Health remains within the Department of Environmental Resources. A legislative study commission has been charged with recommending the ultimate placement of this division.

Environmental Health Challenges

As we move into the 21st century, we must sharpen our focus on environmental health needs to meet new challenges. In North Carolina, environmental health has traditionally been viewed as a matter of septic tanks, vector control, clean water supply, and food sanitation. But it embraces many other health problems facing North Carolina, including problems of poor

water quality related to the toxic dinoflagellate *Pfiesteria* and to corporate hog farming. Many of these concerns disproportionately affect the poor, such as subsistence fishermen on the lower Neuse River or African-Americans living in the rural hog belt.

Pfiesteria

The year 1998 was fairly uneventful in North Carolina; only one Neuse River fish kill was attributed to *Pfiesteria*. Despite the organism's limited activity, the state made several large steps forward in its *Pfiesteria* policy. After years without clear plans regarding *Pfiesteria* exposure, on June 9 the state unveiled a protocol that allows the state health director to close waters at the site of active, ongoing fish kills. The state also improved its education and surveillance efforts directed at *Pfiesteria*. A toll-free hotline was established to take reports of fish kill activity and possible human exposure. Educational programs were conducted through local health departments and media in the coastal area. The state now has a *Pfiesteria*-related illness surveillance and prevention program funded by a grant from the Centers for Disease Control and Prevention (CDC). In addition to education and public information efforts, the grant will cover a prospective cohort study of exposure to risky estuarine waters.

Two studies released this summer add to the growing body of evidence that *Pfiesteria* affects human health. A Maryland study, published in the British medical journal *The Lancet*, concluded that people with environmental exposure to *Pfiesteria* toxins are at risk of developing a reversible clinical syndrome characterized by difficulties with learning and higher cognitive functions. A North Carolina study, funded by the NC Department of Health and Human Services and conducted by Environmental Protection Agency scientist Dr. H. Kenneth Hudnell, showed that persons working in estuarine waters had reduced visual contrast sensitivity. The results of both studies beg for additional research, in which the DHHS will play a vital role.

Dr. McBride is Assistant Secretary for Health/State Health Director of North Carolina.

Industrial Livestock Operations

North Carolina's hog production has increased at a phenomenal rate, from two million hogs in 1989 to more than 11 million today. Most of the increase occurred on corporate farms, where hundreds or thousands of hogs are raised in large houses and their waste is held in large open pits. North Carolina has more than 2,500 of these hog "lagoons." This almost medieval method of waste disposal raises substantial public health questions related to air, water, and soil pollution. For example, in October 1995, private drinking water wells in Robeson County were found to be contaminated by a nearby hog operation. At Governor Hunt's direction, the state began to test private wells on property adjoining intensive livestock operations. Of 1,595 wells tested, 163 (10.2%) had nitrate concentrations at or above the limit for drinking water. This may pose an increased health risk.

In December, the DHSS became the first public health organization in the country to recognize hog farm odors as a public health problem, and to urge environmental regulators and hog farmers to minimize odor and inhalation exposure. We will be working with our partners in academia and federal, state, and local oversight agencies to develop responsive, science-based information and policy guidance.

NC Health Choice for Children

NC Health Choice for Children was launched on October 1 by Gov. Jim Hunt. This program provides health insurance to the children of the state's working families. So far, more than 18,000 children have enrolled in the program, and associated outreach efforts have brought more than 12,000 children onto the state's Medicaid rolls.

NC Health Choice for Children is designed to help working parents like contract employees, day care and nursing home workers, state employees, and entrepreneurs who cannot afford private insurance. The amount of money families can earn and still qualify for participation depends on the size of the family; a family of two can earn up to \$21,700 and a family of six, up to \$44,100. Families with incomes near the upper limit for family size will pay an annual enrollment fee of \$50 for one child and \$100 for two or more children. They will also make co-payments for services ranging from \$5 for a doctor's visit and \$6 for prescription drugs to \$20 for a non-emergency visit to the emergency room.

NC Health Choice for Children is a comprehensive program, covering doctor's visits, hospitalization, dental care (including x-rays and fillings), vision care (including glasses), hearing care (including hearing aids), care for children with special needs, and prescription drugs. Children are eligible for the program if their families meet the income test and have not had health insurance for the six months prior to application. Children enrolled in Blue Cross/Blue Shield's Caring program, those who have graduated from the Medicaid program, and

those whose parents have lost health insurance coverage through no fault of their own will not have to wait six months to join NC Health Choice for Children. In order to ease enrollment in both NC Health Choice for Children and Medicaid, the state has designed a two-page application form for both programs, which can be received and returned by mail.

Infant Mortality and Low Birthweight

North Carolina's 1997 infant mortality rate was 9.2 deaths/1,000 live births. Since 1970 the state's infant mortality rate has decreased by 62%, and the present rate is the lowest in the state's history; it has been steady at 9.2 since 1995, however, while the national trend has been downward. Two factors responsible for our improvement are better care for expectant mothers and critical care for premature babies. But, while we have reduced some causes of infant morbidity and mortality, our infant mortality rate is still unacceptably high, particularly among minorities. The infant mortality rate for minorities is more than twice that of white infants; in fact, the rate for whites actually declined last year from 7.1 to 6.9, while that for minorities rose from 14.3 to 14.8. Our next major advance in the fight to reduce infant mortality will require solutions to the problems of low birth weight (which has not declined over the past decade) and the health of women before conception.

We must aim to have mothers live a healthier life from their own birth through the delivery of their own babies. Our inability to close the gap between the white and minority infant mortality rates is frustrating. As a society we have made progress toward our goal of ensuring equal access to care, but now we need to look at more deeply rooted problems. We need to ensure that people live in a healthy environment and make healthy choices about exercise, nutrition, smoking, and drinking. For women, that could translate into healthier babies. Some parts of the state have moved to accomplish these goals. For example, the Healthy Start Baby Love Plus initiative in Pitt, Martin, Tyrrell, Washington, Edgecombe, Bertie, and Greene counties works to reduce infant mortality by making existing health services more accessible through transportation, translation services, and short-term childcare. As long as there are barriers to preventive health care, unhealthy women will give birth to unhealthy babies. The success of programs like Healthy Start Baby Love Plus is shown in the fact that 83% of the women in this state begin their prenatal care in the first trimester of pregnancy.

Sudden Infant Death Syndrome (SIDS)

Education is crucial to strong public health programs. Nowhere is this more apparent than in the reduction of deaths attributable to SIDS. In 1997, North Carolina's SIDS rate was the lowest in history at 0.96 deaths/1,000 live births (there was a total of 103 infant deaths in 1997). There has been a slow, steady decline since the 1993 rate of 1.38/1,000 live births, a reduction directly

linked to the efforts of practicing physicians who participated in the American Academy of Pediatrics' Back to Sleep campaign, which advised parents to put their healthy infants on their backs or sides to sleep. We need to apply this successful public awareness approach to other public health problems.

Improving Children's Health Through Partnership and Education

We can take pride in three other statewide efforts: our immunization program, the Healthy Child Care North Carolina campaign, and the Seal the State in '98 campaign. We have made tremendous improvement in our immunization rates. Just a few years ago, more than 40% of the state's two-year-olds were vulnerable to preventable diseases because they were not appropriately immunized. A massive state-wide immunization effort launched in 1993 led to one of the highest rates of appropriate vaccination of two-year-olds in the country (81%). In addition, 90% of North Carolina's infants were immunized against Hepatitis B in 1997 (the highest rate in the nation for that year). The close working relationship between public health and privately practicing physicians has made that possible.

The Healthy Child Care North Carolina campaign owes its national success to the partnership between public health and private medicine. This program provides services and consultation to child care centers on a variety of health and safety related issues and complements Governor Hunt's Smart Start Early Childhood by assuring that children enter school healthy and ready to learn. It wouldn't be possible without the physicians who act as consultants to child care facilities.

I am also pleased to report that Seal the State in '98, a public health program to reduce tooth decay in North Carolina children, received the American Dental Association's Community Preventive Dentistry Award for 1998. This state-wide, community-based effort to increase the use of dental sealants was carried out in all 100 counties, even those with no privately practicing dentists. Dental professionals placed 39,387 free dental sealants on the teeth of 8,828 children on or about February 6, 1998. The value of this service, both in eliminating dental pain and suffering and in donated care, is almost immeasurable. Tooth decay is still the most common nonlimiting disease of school-aged children in the state. The appropriate use of fluorides and sealants can eliminate decay on the pit and fissure surfaces of the permanent teeth in children. We hope that the local teams of dental professionals and community volunteers will continue to donate their time and supplies (some \$2.1 million) toward the goal of sealing the permanent teeth of 50% of North Carolina's school age population by the year 2000.

School Health Services

Clearly, the health status of children has improved in many ways, but there are many unmet needs. An important area where

North Carolina needs improved services is in school health. North Carolina has one school nurse to every 2,400 students. This lack of health professionals has profound implications for the health, safety, and even education of our children. Some children—especially those who are disabled, sick, neglected, or abused—are at particular risk. We need a concerted commitment to improve school health services in North Carolina.

Newborn Screening Battery

The State Public Health Laboratory has formally adopted an expanded newborn screening battery which will test for an additional 20 metabolic conditions. We estimate that 25 infants with the newly screened metabolic disorders will be identified each year. This cost-effective measure will prevent death, ameliorate developmental problems, and save newborns and their families from suffering.

Asthma

Asthma is the leading medical cause of school absences, the second most prevalent chronic illness among school aged children, and a condition that accounts for 17% of all emergency department visits. It appears to be on the increase. In June 1998, I established a task force to design a statewide comprehensive approach to childhood asthma. This multi-disciplinary team, which includes members of the North Carolina Medical Society, will define the extent of the problem in North Carolina, identify components of effective community-based asthma management, identify a public awareness strategy for school age children and school personnel, and identify appropriate environmental interventions.

AIDS/HIV

The North Carolina AIDS/HIV profile has changed dramatically in the past few years. What once was a disease affecting mainly gay white men now strikes a disproportionate number of African-Americans, often women and children. Minorities constitute a quarter of North Carolina's population, but they accounted for two-thirds of the AIDS cases and three-quarters of the HIV infections from 1994-96. Three out of every 100 persons with HIV are between 13 and 19 years old. Equally disconcerting is the disproportionate impact of AIDS and HIV on African-American children (79% of pediatric AIDS cases and 81% of pediatric HIV cases are African-American).

The state's HIV/STD Prevention and Care Section estimates that almost half of the reported HIV cases from 1995 to 1997 were associated with drug abuse. That points to the need for a needle exchange program. We know needle exchange programs work: A 1993 Connecticut study showed a 33% reduction in the rate of new HIV infections among needle

exchange program participants, and the CDC says that this estimate may be low, that even more people may have been saved. Connecticut, Massachusetts and New York have made needle exchange programs legal, but a 1997 measure failed in North Carolina. We hope for success in 1999.

We are reaping the benefits of more effective therapy for HIV. In 1997, 480 North Carolinians died from AIDS, down from 1,011 in 1995. But while the rates of AIDS cases and deaths are declining, the rate of HIV infection remains steady. People are living longer and remaining healthier even though they have HIV. Obviously, that's good news, but AIDS/HIV treatment is very expensive. Basic HIV treatment cost \$12,000/year in 1997, up from \$3,000 in 1995.

We're beginning to meet the challenge posed by the treatment of AIDS/HIV, but we still face a formidable challenge in changing the risky behavior that leads to AIDS/HIV infection. In order to change risky sexual behavior, we need to educate the public—especially young people—about those risks.

In fact, many of our public health problems pose formidable educational challenges. Meeting those challenges is a major part of what the public health community must accomplish in the 21st century. □

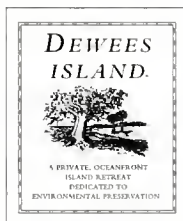
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A Report on My Headaches

David Simel, MD

Editor's Commentary In 1958, Sir Richard Asher asked in print: "Why are medical journals so dull?"¹ Forty years later I am still wondering the same thing. In part, as Asher pointed out, the problem begins with the oral presentations that often form the prelude to the written essay. Authors seem to be afraid to take risks, to venture saying aloud or in print anything that has not been (even somewhere else by someone else) already committed to ink and paper. They are slow to call attention to their personal experience; slow to reveal their inner lives. They seek refuge in the anonymity of the passive voice, the avoidance of first-person pronouns. The ultimate example of the absurdity of such faceless anonymity is shown in Asher's example of the footnote to a medical paper, which said, "Since this article was written, unfortunately one of us has died." Hard to be more self-effacing than that! And hard to write more lifeless prose about a death.

I would be willing to argue that medicine is all the poorer for the scarcity of good accounts we have from doctors about their own illnesses. So when I heard David Simel present the story of his headaches (and the subsequent adventures with the healthcare system they entailed), I knew I wanted it for the Journal. It appears here now, and provides, to my reading, a remarkably fresh view of illness "from the other end of the stethoscope." Over the years, doctors have become accustomed to reading professional accounts of illness, but these are almost invariably by doctors reporting their imaginings of the patient's experience (and such reports are often unbearably dull). Occasionally, patients recount for us their perceptions of illness. The famous article by Norman Cousins comes to mind in this regard, but it suffers from the author's medical naiveté and an allegiance to his own idiosyncratic explanations of his symptoms. The rarest of reports, it seems, are those by doctors themselves, writing as patients. Simel's report falls into this category, and we are pleased to offer it here.

¹Asher R. Why are medical journals so dull? Br Med J 1958;2:502-3.

²Cousins N. Anatomy of an illness (as perceived by the patient). N Engl J Med 1976;295:1458-63.

It is funny how you remember some things, but not others. I remember exactly where I was when I heard about JFK, but I do not remember exactly when the headaches started.

The Beginning

Sometime in the Fall of 1991, every weekday morning and early afternoon, the right side of my head hurt. The left side hurt a bit, but the pain always started on the right. Sometimes the right hurt so much I could not figure out if the left even hurt at all. I assumed I had tension headaches brought on by increased demands at the hospital (an hypothesis supported by a tendency for the headaches to occur on weekdays).

Still, I could not convince myself completely that stress was the issue. I reckoned that people who need an explanation for symptoms can always find something (perhaps otherwise

insignificant) going on in their lives to which they could attach somatic meaning. The very idea that I was a victim of stress, that I was having tension headaches, affronted my sense of self-value. Furthermore, I honestly did not *feel* stressed. In between headaches I was fine, and there were other, more concrete reasons why I did not like the explanation. For example, why would I consistently experience stress on one side of my head? It seemed to me that stress ought to affect the left as often as the right. And what type of tension occurred during sleep? My daily routine began at 5:00 AM when I awoke to read the newspapers and drink coffee, but I had begun to wake around 4:00 AM after what otherwise seemed like a good sleep. Within 30 seconds of rising, my head began to hurt. In that fugue state between asleep and awake, I could not figure out whether headache had ended my sleep, or whether it had been initiated by getting out of bed. I eliminated the "getting out of bed" explanation by lying still after awakening to see if the headache started while I was prone. It did.

Perhaps the headaches originated in my sinuses. I found it remarkable that my right nostril was stuffy when I would wake in the middle of the night, even without a headache, but I could

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blow out nothing. The stuffiness usually left after I had been awake for about 10 minutes. Again, I was puzzled. One nostril was stuffy, but I had no other symptoms of sinusitis. What type of infectious sinusitis would last 10-30 minutes, stay away all day, and then return at 5:00 AM? Could it be allergic sinusitis? Would allergens only attack my right nostril, not the left? What kind of allergens would disappear within 10 minutes of waking? Sleeping on a plastic pillow case did not resolve the problem. The only thing that made sense was that the nasal stuffiness, temporally associated with my headache, represented a vasomotor rhinitis. But I did not understand the connection.

Initially, the headaches occurred without warning. I rubbed my temples to no avail. I tried freezing my temples with ethylene oxide, to no avail. By 10:00 AM I could not decide whether I had had enough coffee for the day, or too much. The most disturbing symptom was right eye pain. In fact, I began to appreciate that we go through life knowing we have eyes only because we see. During the headache I knew I had a right eye because I could perceive there was something *in* the socket where my seeing eye rested. What I was sensing was a tactile eye, a stone-like structure that felt like a finger hit by a hammer then slammed in a car door. This symptom was so pervasive that I would stare in the mirror to see if the sclera had turned red or the pupil had changed.

Riding the elevator was fine until it stopped. I began to take the stairs.

I drank less coffee, then more coffee, without effect.

I thought about the foods I had eaten, both the day before and the day of headaches. I could make no new connections. From college on, I had known that more than one glass of red wine always gave me an early morning headache. One glass of white wine, or a beer at dinner, did not have the same effect.

In the past, my mother had asked me about *her* headaches. I never knew what to say other than the typical medical student response, "Talk to your doctor." Her headaches were equally unbearable, and she frequently became nauseated. I thought she created headaches, though, about as well as she received, so I never considered her problem in relation to mine. I began to retreat to my closed office, sealed away from sound, preferring light from a soft bulb and the computer screen to the overhead lights. I hated answering the telephone.

A Bad Day

About three months after the headaches began, I had scheduled a mid-afternoon site-visit rehearsal for a grant. Hustling across the road towards the hospital, I felt the sudden onset of the second-worst headache of my life. (The worst followed a spinal tap years before, which led me cynically to believe that anyone claiming the worst headache of his life never had a lumbar

puncture.) The light was painfully bright and I transiently lost the sense of danger one gets jaywalking across a busy road. I consciously resisted vomiting as I walked into the meeting. I did not do a good job with my presentation. I could only talk in subdued monotones, which made it difficult for me to display enthusiasm about the proposed work. Voices, including my own, intensified the pain. I chose short, terse answers to questions, certain that they sounded like disdain. I left the room and went back out into the sun. I was upset and tearful, but did not cry. This was the first time I noticed a significant emotional component or reaction to my headaches. I could not decide whether the emotional lability represented frustration, pain, disappointment at a poor performance, or sadness. Whatever the case, I knew the headaches had evolved from a purely invisible, physical pain to something potentially more complex. I could not understand why my right eye was sadder than my left. By afternoon, the headache was gone and I felt fine.

The Light

"I decided to pretend nothing was wrong and prepared to call in my first patient. Repeatedly I got up, hesitated, then sat down . . ."

One Friday I woke at the usual time, felt well, and went to Grand Rounds. Afterwards, in the clinic, the medical charts did not look right, as though I had walked out of an afternoon movie into bright sun. Aside from the brightness, parts of the chart were either missing or out of focus. By moving the chart around I could eventually see everything. Nothing hurt; in fact, I felt full of energy and a bit euphoric. I decided to pretend that nothing was wrong and prepared to call in my first patient. Repeatedly I got up, hesitated, then sat down and tried to figure out whether the problem was in my left

eye, right eye, or both. I walked over to the ophthalmology clinic and asked them to take a look, suspecting a refractive error or a change in my astigmatism that I had not previously recognized.

The resident checked my visual fields and found a right scotoma. The left was normal. I thought that was absurd but gave him permission to dilate my eyes. I decided to go back to clinic hoping that I could call my first patient before I had to return for funduscopy examination with fully dilated eyes. It was not a good decision. The light was even brighter through dilated pupils, and my right eye suddenly felt as though it were turned to stone. I asked the resident to reverse the mydriatic effect, certain that the pain would resolve. In my mind, the pain was attributable to his drops. He was more concerned about my blind spot and a large nevus that he saw. I was not concerned, because—*if* there was a blind spot and *if* there was a nevus—I was quite certain the two were totally unrelated. I again asked that he reverse the mydriasis to make my headache go away. Instead, I got an immediate appointment in the Duke Eye Center. I walked across the street, angered even more that he had sent me back into the light without sunglasses. The attend-

ing ophthalmologist came into the room and greeted me with, "So, David, how long have you had migraines?" The light became unbelievably bright.

The diagnosis was a relief, but also humbling. Not only had I misdiagnosed myself, I had also discounted my mother's similar problem. Only a small bit of objectivity probably would have led to an earlier diagnosis. My sister, too, had suffered from headaches since her teen years, although she had never told me about them. In all honesty, I thought she, like my Mom, gave more headaches than she received, but the family history supported the diagnosis. About three years later, my brother developed headaches, too.

The attending ophthalmologist confirmed the nevus and arranged for visual fields and fundus photographs (a rather unpleasant proposition in the middle of a headache). I steadfastly refused a neuroophthalmologist's later recommendation that I undergo a CT scan because "migraines are a diagnosis of exclusion." Many patients with chronic headaches request or get referred for a CT scan, but I was not interested. My neurologist, Dr. M, supported my decision.

Treatment

I was given a prescription for a low dose of long-acting propranolol. Because of the prominent unilateral nasal stuffiness, ocular pain, and occasional unilateral tearing, Dr. M wondered whether I might be suffering from cluster headaches. When I saw no appreciable benefit after about two months on propranolol, the dose was increased. I began to tire more easily and felt ready for sleep by 9:00 PM. The evening fatigue was so disruptive that I could no longer bring meaningful work home. That meant no work on manuscripts or grants in the evening, a matter which concerned me greatly. However, it was impossible for me even to try the work, so I concentrated on becoming as efficient as possible during the day.

A Bad Vacation

Our first family vacation since the headaches had begun was scheduled for June. I was on long-acting propranolol, 80mg a day. The morning of the second day of vacation was heralded by the onset of a headache. It did not abate. Though I tried to play golf, the sun was intolerable. By afternoon I was in trouble—I was nauseated, could talk only in whispers, and had to be alone. The pain was present when I tried to sleep that night, and sleep never came. Forty-eight hours into the headache, the helplessness and exhaustion were as bad as the headache itself. In addition, the pain was so severe that for the first time I wondered how such constant pain (and the presumed abnormality in circulation that caused it) could be safe for my brain. I worried about a stroke. I had never before used narcotics, but I felt it was now time. The notion of going to an emergency room to ask for pain relief was absolutely incompatible with all my

prior bad memories of patients who had requested the same of me. I feared being labeled a drug seeker. I telephoned a local neurologist whom I had known from my house staff days—he offered no advice and told me I should call Dr. M. It was humiliating, but I took his advice and tearfully called him. There was no question that the emotional reaction to my headache, now 72 hours in duration, was becoming as important as the pain itself. I was as fearful of what might be happening as I was about what Dr. M might think when I called in total despair. Dr. M reassured me that there was little likelihood of a stroke. That helped but acetaminophen with codeine did not. The nausea produced by the medication was so severe that I vomited back the tablets and continued to heave for 30 minutes. An anti-emetic suppository provided relief and I finally fell asleep. When I awoke the next day, I was fine.

I have subsequently discovered that my reaction (and despair) was probably common. I found a passage written by Irvin D. Yalom from his historical fiction, *When Nietzsche Wept*. In the story, Professor Nietzsche consults a Viennese physician, Dr. Brueuer, for advice. At the conclusion of Dr. Brueuer's evaluation, Nietzsche requests and receives permission to ask Dr. Brueuer questions about his headaches. Dr. Brueuer promises to answer. Nietzsche asks, "When you hear my questions, you may, like many of your colleagues, regret that promise. I have a trinity of questions, three questions, but perhaps only one. And that one question—a plea as well as a question—is: Will you tell me the truth?"

"And the three questions?" Brueuer asked.

"The first is: Will I go blind? The second, Will I have these attacks forever? And finally, the most difficult question: Do I have a progressive brain disease which will kill me young like my father, drive me into paralysis or, worse, into madness or dementia?"

Adjusting Medication

Dr. M suggested a switch from the long-acting form to generic propranolol, three times a day. In his experience, this sometimes worked better. He gave me hydrocodone to keep at home, and it did not nauseate me like codeine. I began taking generic propranolol, 20mg three times a day. Even at this lower total daily dose, after about 2 weeks I thought that the headaches were more tolerable. A stepwise dosage increase to 80mg three times a day produced a definite decrease in frequency and intensity of headaches. The plan was to stay on propranolol until I had gone six consecutive months without a significant headache. I stayed on the propranolol for four years, never totally free of headaches, but kept at a level that I could easily tolerate. I did have important side effects, but none so serious that I would miss a dose. The early evening fatigue never left. Exercise during the day became difficult, though this may have been mostly lack of effort. When I did exercise, a dry cough began as soon as I started a very slow jog. With hard exhalation, I appreciated a subtle wheeze, though I'd never been diagnosed

with asthma. Exercise never induced a headache, nor did it have a consistent effect on headaches that were present.

Neither propranolol nor the headaches had any affect on sexual interest or activity. Sexual activity neither exacerbated nor relieved existing headaches; it did not induce new headaches. I was concerned that taking propranolol "forever" might someday present problems, but not so concerned that I wanted to change.

Controlling the Headaches

As the headaches gradually abated in intensity, they became easier to manage. Nonsteroidal anti-inflammatory drugs were adequate during the day. Most of the time when I had a headache, no one else knew. Visual symptoms associated with the headache became infrequent, but sometimes a brief period of unexplainable euphoria with rapid, giddy speech heralded ocular pain or a headache. Disturbed sleep invariably caused some discomfort the next day. I would get into cycles of earlier and earlier wakefulness, sometimes rising at 2:00 AM, which guaranteed a morning headache.

I made a pledge to myself that I would only take hydrocodone at night and only for a significant headache at bedtime. I never used it for sleep in the absence of a headache. I have never used more than 30 tablets a year, but I do not take overnight trips without bringing hydrocodone with me.

When sumatriptan became available, I thought it might be a reasonable daytime alternative to try while at work. Many of my own patients asked for it when it first came on the market; very few still use it or ask for it at all. Personally, I hated it. Injecting sumatriptan was uncomfortable, the sensation it created was unsettling, and for me it did not work well. It might reduce a headache of 8 (on a scale of 10) to a 3 or 4, but I would rebound right back to 8 after about one or two hours. I gave up on sumatriptan for routine abortive therapy but took some with me on vacations for emergencies. It is clear that my experience does not generalize, because many of my patients do take the medication with success. I have not tried oral sumatriptan.

Getting Off Propranolol

I gained weight and was not happy about it. After 6 months without a severe headache, I thought it reasonable to stop taking propranolol. The headaches promptly recurred. Cutting down from 80 to 60 mg 3 times a day also resulted in headaches. A slower taper was necessary. I cut 20mg from my total daily dose for a month before another reduction. At 20mg 3 times daily, I became concerned that I would never get all the way off, because the headaches increased in frequency and intensity. I thought exercise might help. I began exercising regularly to try to lose about 10 pounds. Immediately, I started sleeping better, and I completed the rest of the taper without difficulty, though it took me 8 months to get completely off the medication.

Today

I still have headaches, one day out of three. Only occasionally do I find myself nauseated and having to disrupt my activities or cancel meetings. Over-the-counter medications are perfectly adequate, though I limit what I take so as not to medicate excessively. About twice a month I might take hydrocodone for a nocturnal headache; but a half-tablet will often suffice. Sleep disruption continues to induce headache, especially waking between 2:00 and 3:00 in the morning. I've discovered that a very short-acting anxiolytic works perfectly, leaving me refreshed in the morning with no hangover effect. So well, in fact, that I estimate my really severe headaches now occur only about three times a year. I take the anxiolytic with me on vacation and find it invaluable when jet lag would otherwise incapacitate me. I do not take the anxiolytic if I have had a beer earlier in the evening, and I limit use to about twice monthly (the memory of addicted drug-seekers requesting medication was imprinted on me during my formative housestaff years).

I find I can take a history from patients with headaches much better than my colleagues can; it seems that I can phrase the history in a way that is comprehensible to my patients. For example, I never ask: "Do you have pain behind the eye?" Instead, I know to ask them if their eye "hurts" during the headache, or whether they have the sensation that their eye feels different. And I'm more sympathetic to my Mom, sister, and brother, to whom I should have been listening all along. □



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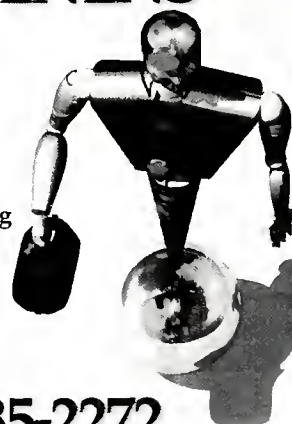
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Seizures and Creutzfeldt-Jakob Disease

A Case Report and Series Review

Ilkcan Cokgor, MD, Marvin Rozear, MD, Joel C. Morgenlander, MD

Creutzfeldt-Jakob disease (CJD) is a relatively uncommon cause of dementia, thought to be caused by infection with a transmissible agent (a prion). The disease consists of the following clinical triad: (1) rapidly progressive dementia; (2) startle myoclonus; and (3) a characteristic (but not pathognomonic) electroencephalogram (EEG), showing periodic sharp wave complexes. Interestingly, although the EEG is abnormal in about 80% of patients with Creutzfeldt-Jakob disease, focal motor or generalized tonic-clonic seizures have been reported to occur in only 10-15% of patients.¹ When they occur, seizures are usually accompanied by the cardinal features of CJD.¹

Our interest in the association of seizures and CJD was sparked by a patient who developed status epilepticus refractory to medical treatment and only later was diagnosed with CJD. Her case led us to review the records of all patients diagnosed with CJD at Duke University Medical Center (DUMC) from 1975 to 1996, paying special attention to the incidence and types of seizures seen.

Our Patient

A 56-year-old woman was admitted because she was slow to awaken from sedation given during esophagogastroduodenoscopy performed to evaluate nausea, vomiting, and abdominal pain. By the time we saw her, she had returned to baseline mental status but complained of recent memory loss. She was anxious but fully oriented. Bedside testing of cognitive function was normal. Cranial nerve, motor, and sensory examinations were normal. Deep tendon reflexes were brisk throughout, and plantar responses were flexor. She had an essential tremor. Gait was normal. There was no myoclonus.

Screening blood and urine tests, including tests for HIV antibodies, were normal. Spinal fluid was normal. Magnetic

resonance imaging of the brain showed mild diffuse atrophy. EEG showed mild background slowing with bitemporal epileptiform sharp waves, most prominent on the left.

Four days after admission, she abruptly went into generalized status epilepticus. Intravenous lorazepam, phenytoin, and phenobarbital failed to stop the seizures and so she was given pentobarbital by infusion until a burst-suppression pattern was demonstrated by EEG. Every attempt to wean her from the anticonvulsants was met by a return of status epilepticus. After one month in the intensive care unit, her family agreed to withdraw medical support, and she died.

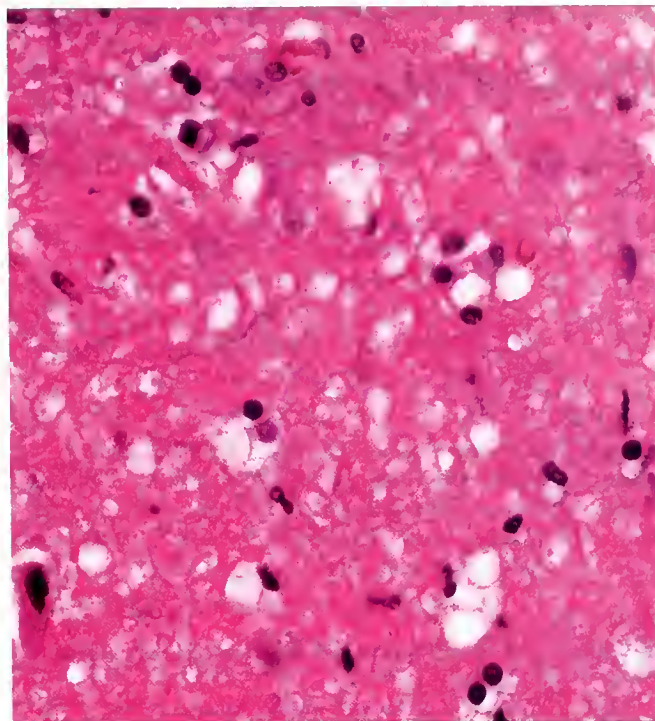
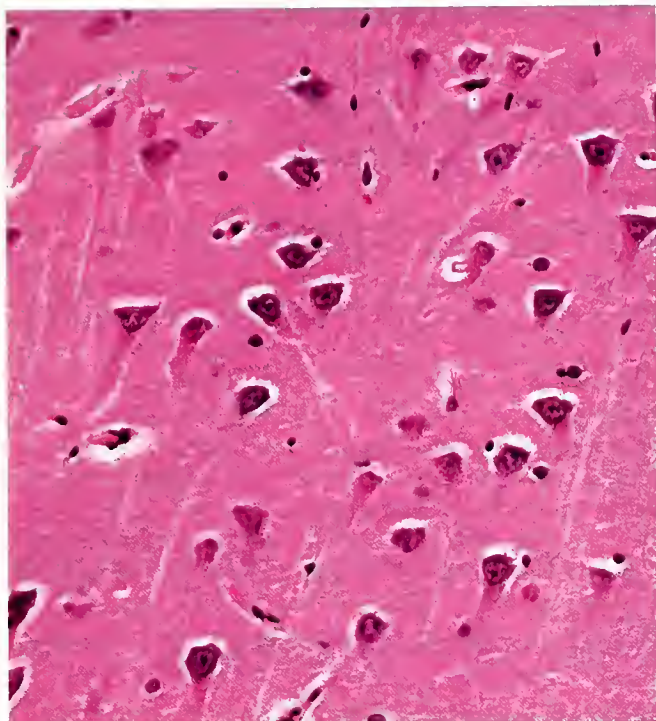
At autopsy her brain demonstrated severe neuronal loss and gliosis in the right and left hippocampus. There was marked spongiform change in the hippocampi, temporal and occipital lobes, cerebellum (including white matter), and dentate nucleus, compatible with Creutzfeldt-Jakob disease (Figures 1 and 2).

The Duke Experience with CJD

Between 1975 and 1996, 21 patients at DUMC with pathologic findings of a spongiform encephalopathy and appropriate clinical features were diagnosed with CJD; there were 11 men and 10 women, ranging in age from 40-79. In 13 (including the case described here) of the 21 patients (62%), memory loss was the first symptom. Other initial symptoms included ataxia in 3; myoclonus in 2; and personality change, dysarthria, and hemiparesis in 1 each.

All 21 patients had abnormal EEGs, and 5 had seizures (focal motor seizures, with or without secondary generalization, or primary generalized tonic-clonic seizures). The patient described in this report was the only one with generalized status epilepticus. EEGs in the five patients with seizures showed diffuse slowing and periodic lateralized epileptiform discharges in 3, a burst-suppression pattern in 1, and generalized seizure activity on a background of diffuse slowing in 1 (the case described here). Pathologic examination showed diffuse spongiform changes involving the neocortex and hippocampus in all.

The authors are all with the Division of Neurology, Department of Medicine, Duke University Medical Center, Durham, NC



Figs. 1 and 2: Hematoxylin and eosin/luxol fast blue stained sections of Zone CA1 of the hippocampal formation [left = control; right = patient]. Note severe neuronal loss, gliosis, and spongiform changes in affected hippocampus. Photographs courtesy of Christine Hulette, MD, and Susan Reeves, Duke Medical Center Photopath Laboratory.

Comment

In the 21 Duke patients, memory loss was the most common presenting complaint, followed by ataxia, myoclonus, personality change, and weakness. These presenting features are similar to those described in other patients with CJD.^{2,3} On the other hand, seizures are not often described as the presenting feature, although they can occur during the course of CJD. We note that 24% of patients seen at Duke had seizures, and one (described here) represents the only reported case of status epilepticus in a CJD patient. Our case was even more unusual in that seizure was practically the initial symptom. We believe the prominent pathologic changes in both hippocampi made this patient's seizures resistant to treatment. We conclude from our experience that the diagnosis of Creutzfeldt-Jakob disease is worth considering whenever new onset seizures occur in a patient with memory loss and other suggestive symptoms and signs. □

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Info: Contact Dana Hammermeister, NCMS, 800/722-1350 or 919/833-3836, fax: 919/833-2023
e-mail: dhammermeister@ncmedsoc.org
Internet: <http://www.ncmedsoc.org>

March 20

Movement Disorders: Update and Case Presentations

Place: Charlotte City Center
Credit: 5.5 hours Category 1, AMA
Info: Emory University CME, 404/727-5695; fax: 404/727-5667;
e-mail: cme@emory.edu

March 26-27

Neurology Update and Practical Pediatrics (separate courses)

Place: Winston-Salem
Credit: 12 hours (Neurology), 9 hours (Pediatrics)
Info: WFU Office of Continuing Education, Medical Center Blvd., Winston-Salem 27157, 336/716-4450, 800/277-7654

April 9-10

19th Annual James Harrill Lecture

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April 7-11

13th Annual Course in Critical Care Medicine

Place: Grand Hyatt Hotel, Washington, DC
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Info: Center for Bio-Medical Communication, 201/342-5300; fax: 201/342-7555; *email:* cmeinfo@cbcbiomed.com

April 14-16

23rd Annual Internal Medicine Conference

Place: Friday Continuing Education Center, Chapel Hill, NC
Credit: 22.5 hours, Category 1 AMA
Info: UNC Office of CME, 919/962-2118; fax: 919/962-1664

April 23-24

Progress and Challenges in Stem Cell Transplantation

Place: Levine Science Research Center, Duke
Credit: 7 hours, Category 1 AMA
Info: DUMC Bone Marrow & Stem Cell Transplant Program, DUMC; 919/419-5500

April 23-25

Necessary Conversations: Health Care for Mid-Life Women

Place: Embassy Suites Hotel, Cary, NC
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Info: Ann J. Brown, MD, DUMC; 919/684-4139;
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April 23-30

58th Annual American Occupational Health Conference

Place: Ernest N. Morial Convention Center, New Orleans
Info: American College of Occupational and Environmental Medicine, 55 W. Seegers Road, Arlington Heights, IL 60005, 847/228-6850, ext. 180
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April 30-May 1

12th Annual Surgical Symposium

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May 12-14

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Internet: <http://www.carolinas.org/symposium/>

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June 26-29

2nd Annual Duke Cardiothoracic Update

Place: Hilton Resort, Hilton Head Island, SC
Info: Brenda Mickley, 919/681-3883, fax: 919/681-7893
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August 2-6

28th Emory Miller Medical Symposium

Place: Winston-Salem
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Aphorisms of the Month

Daniel Sexton, MD, Section Editor

"Odds and Ends from the Internet"

If I had eight hours to cut down a tree, I would spend seven sharpening my ax.

—Abraham Lincoln

It is possible for your mind to be so open that your brain falls out.

—Anonymous

A great many people think they are thinking when they are merely rearranging their prejudices.

—William James

These are my new shoes. They're good shoes. They won't make you rich like me, they won't make you rebound like me, they definitely won't make you handsome like me. They'll only make you have shoes like me.

—Charles Barkley

Experience is that marvelous thing that enables you to recognize a mistake when you make it again.

—F. P. Jones

Once at a social gathering, Gladstone said to Disraeli, "I predict, Sir, that you die either by hanging or of some vile disease." Disraeli replied, "That all depends, Sir, upon whether I embrace your principles or your mistress."

The overwhelming majority of people have more than the average (mean) number of legs.

—E. Grebenik

Sacred cows make the best hamburger.

—Mark Twain

Section editor is Dr. Dan Sexton, Box 3605, DUMC, Durham, NC 27710. e-mail: sexto002@mc.duke.edu

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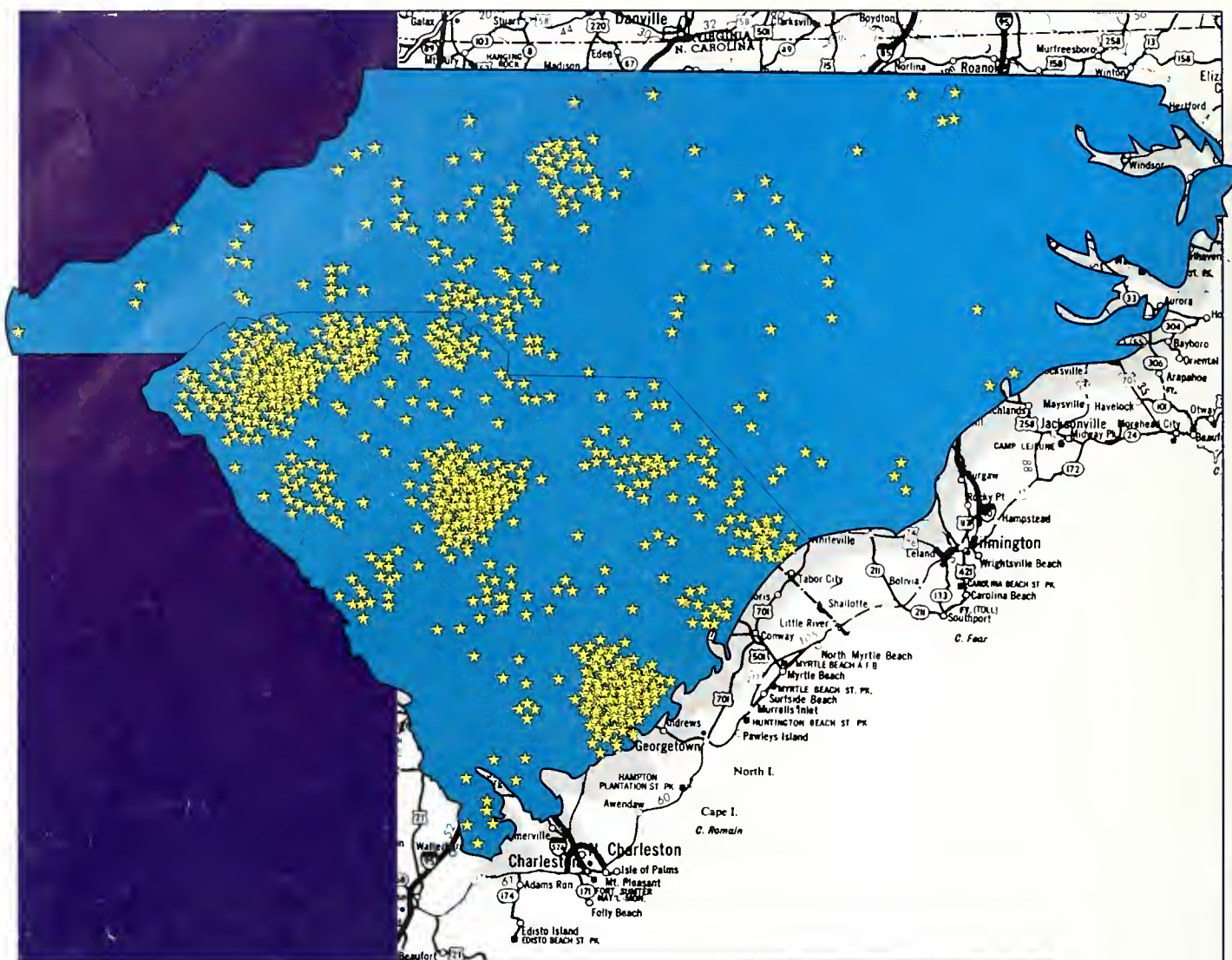
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The Official
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May/June 1999
Volume 60
Number 3

MAY 19 1999

North Carolina Medical Journal

For Doctors and Their Patients


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1849-1999*



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For Doctors and their Patients

May/June 1999, Volume 60, Number 3

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FOR DOCTORS AND THEIR PATIENTS

May/June 1999, Volume 60, Number 3

Cover: This handsome medallion is from the North Carolina Medical Society's 150th anniversary commemorative plate, a limited edition designed by Vietri Pottery of Hillsborough and handmade in Italy. Information for ordering the plate is on page 161 of this issue.

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Letters to the Editor

Community Dialogue Makes Good Medicine

To the Editor:

I was intrigued by the article "Lessons from Communities: The Colorado Experience" from a special issue of the *North Carolina Medical Journal* titled "A Community Policy on Medical Futility? A Conversation of the North Carolina Community" (NC Med J 1995;56).

I am an internist who earned my MD at Duke in 1976, and I am now working with a nonprofit organization called the Institute for Family-Centered Care in Bethesda, MD. Our mission is to promote a more collaborative health-care model that incorporates the needs and wishes of patients and their families into every aspect of the health care process. The kind of collaborative endeavor that is described in this issue of your journal, and which concerns an issue that is of vital importance, is something that deserves to be discussed and followed by the national and even international community.

We are working to disseminate information about "best practices," encourage dialogue, research, and education in every area of health care, and facilitate the creation of communities of partners that can learn from each other in order to move toward systems and practices that best serve everyone's needs. We would like to know more about the North Carolina experience so that we can describe it as an example of progressive dialogue and the kind of collaboration that professionals need to become comfortable with and skilled at. I hope that you will be able to provide us with a copy of that issue so that we can "spread the word."

Barbara Blaylock, MD
Institute for Family-Centered Care
7900 Wisconsin Ave, Suite 405
Bethesda, MD 20814-3601

Domestic Violence: Fueled by Alcohol?

To the Editor:

I have enjoyed reading the Letter to the Editor from Dr. Goodman, the chair of the North Carolina Medical Society Domestic Violence Committee. This is a good letter, as are many speeches I have heard about domestic violence. However, what no one seems to mention is that a very large percentage of domestic violence cases are related to alcohol.

My father, a general surgeon, used to say, "Tobacco will kill you, but alcohol will make a fool of you." What he should have said was, "Tobacco will kill you, but alcohol will kill other people."

That is certainly true of domestic violence, homicides in the streets, and automobile accidents.

I wonder whether it might not be valuable to test the alcohol blood levels of those who have perpetrated domestic violence. I think it would be very revealing.

Eben Alexander, Jr., MD
Wake Forest University School of Medicine
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NCMJ: Hot Off the Web at <http://www.ncmedicaljournal.com>

To the Editor:

I just downloaded your updated web page to preview our article on pesticides (Swinker et al, NC Med J 1999;60:77-82). You have done an excellent job on this issue. I look forward to reading the hard copy — the other articles look very interesting.

C. Gregory Smith, MD, MPH
Chair, NMCS Occupational and
Environmental Health Committee
UNC School of Public Health

... And Always Glad to Help

To the Editor:

I am a consultant in the Strategic and Managed Care Consulting division of the largest not-for-profit hospital alliance in the US. While doing research on the Internet I came across a wonderful list of articles published in the November/December 1997 issue of the *Journal*. Specifically, I was interested in the article "How to Open a Free Medical Clinic" by Hans C. Hansen, MD. If I could obtain a list of other articles available through your publication this would be most helpful.

Julie Adams
Premier, Inc.
PO Box 668800
Charlotte, NC 28266-8800

To the Editor:

Two of the articles in the March/April 1997 Special Section on Issues in the Health of Gay and Lesbian Patients remain among the best summary articles in the medical literature. I would love to be able to distribute copies of Elizabeth Rankow's "Primary Medical Care of the Gay or Lesbian Patient" and Mark Townsend's "Gay and Lesbian Issues in Graduate Medical Education" when I do trainings related to health issues of gay and lesbian patients.

Margery Sved, MD
Dorothea Dix Hospital
Raleigh, NC 27603-2176

From the Editor:

We're always pleased to hear that the *Journal's* articles are useful. Dr. Sved and others will be interested in Dr. Halperin's account in this issue (p. 138) describing some repercussions of the Special Section.

We want to make *Journal* articles easy to find, and readily grant permission for their distribution (with authors' concurrence). Summaries of all articles published in the last year are available on the NCMJ website; annual indexes of articles appear in our November/December issues; and we're listed in Index Medicus.

An Eye-Opener on Migraines

To the Editor:

Thank you so much for publishing Dr. David Simel's personal experience with migraine headache (NC Medical Journal Mar-April 1999). I found the prose to be particularly evocative of a condition from which I have never suffered. As practitioners we cannot possibly experience every illness to which humankind is prey, but first person articles published in medical journals can offer us unique insight from a provider's perspective—replete with our preconceptions and prejudice—and assist us in delivering more knowledgeable and compassionate care. I applaud Dr. Simel's honesty in delivering an eye-opening look into the impact migraine headache may have on someone's daily life.

Kathryn Vokaty, PA-C
Box 3099
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Durham, NC 27710

To the Editor:

I thought you might be interested in the feedback I've gotten on my headache article (NC Med J 1999;60:104-7):

A surgeon in practice called me to discuss his headaches and whether or not he should go on preventive medicine. He thought it was harder for men to have migraines compared to women, because of societal expectations. He never had to cancel an OR case, though he has stepped out of the OR to vomit because of a headache.

A well-meaning physician offered me a referral for

acupuncture. An academic attending found my presentation interesting because he had never in his life had a headache — not even one. I inferred just a hint of superiority.

A female academic attending said it was well-written and that she found it much easier to feel empathy for her patients with headaches. Before reading the article, she felt "nothing" when they described their despair.

My generalist physician called and said he was going to see his doctor to start propranolol for his headaches!

My brother said he was glad he didn't have headaches anymore. He thought it was good in that it seemed written for him (a lay-person), but also contained medical information he found interesting.

My father (an ophthalmologist) told me about my sister when she was a teenager. When she first had migraines, he recalled his own medical training and the now outdated paradigms he was taught about headaches. He informed my sister that "no one in our family was going to have headaches!" He didn't realize how much I was affected by the headaches.

My mother also didn't realize I had as many headaches as I described. She was upset that I had not told her of my plight. She then proceeded to give me a migraine diet that her physician had given her. She related that she had shared it with many friends who had found success. I was irritated, but I did not get a headache.

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Guidelines for Letters

We welcome reader feedback. Type and double space all letters; keep length to under 500 words. We do welcome occasional longer letters, which we may publish as commentaries. We reserve the right to edit and abridge submitted text. Send letters to: *North Carolina Medical Journal*, Box 3910, DUMC, Durham, NC 27710, 919/286-6410, fax: 919/286-9219, e-mail: nash0004@mc.duke.edu

E R R A T U M

On p. 73 of the March/April issue, a table accompanying the article by Drs. Hunt, Hader, Files, and Corey (Arsenic poisoning seen at Duke Hospital, 1965-1998, NC Med J 1999;60:70-4) contains a misleading typographical error. The number of accidental exposures in the present study should be 11, not 1; 14% is correct. We regret the error.

Serendipity and Opportunism

Building a Pathology Department in Mid-Century America

John B. Graham, MD

I have entitled this discussion about the building of a medical educational department "Serendity and Opportunism" because our Pathology department was built on those principles. The building of our department was not unique. It probably happened in similar ways in most American medical schools after World War II. The past half-century has been a truly "Golden Age" in more senses than one. But my remarks here are based only on my personal experience at a single institution, the University of North Carolina, and relate only to the period 1946-73, the time of greatest change in the department. Looking back, my career and the development of the Department of Pathology appear as a succession of opportunities and serendipities. I ignored many, but pursued some. Had I had pursued all, I should have become a dilettante. Had I had pursued none, I would have become a drone.

What do the words of my title mean? "Opportunism" is fairly straightforward. It refers to the policy of taking advantage of favorable circumstances, such as occur in business, war and politics—the policy of "making hay while the sun shines." Serendipity is more complex and slippery to define. Webster says the word, coined by Horace Walpole in the 18th century, refers to the "faculty of finding valuable or agreeable things which were not sought." In short, it means encountering and capitalizing on unexpected and favorable accidents. Walpole got the idea from a Persian fairy tale in which three princes travel around the island of Serendip (a former name for Ceylon) making one agreeable discovery after another.

When one takes advantage of an opportunity, the goal is usually obvious; when exploiting a serendipity, on the other hand, the outcome is usually less clear and more a matter of hope. In dealing with serendipitous events it is crucial to

choose the fruitful ones. There seem to me to be three basic requirements for doing this successfully: (1) a prepared mind, (2) the self-confidence to gamble, and (3) the courage to cut losses when a mistake has been made.

What do I mean by a "a prepared mind"? I mean one with enough knowledge and experience to recognize a serendipitous event and the ability to imagine its consequences. The mind is prepared slowly, mainly through education, not as an inborn trait. Preparation may be steeped in science, or in what we regard as "social science," or in literature or history. Some extraordinary minds among us—look at Patrick O'Brian, the 85-year-old author whose novels about Captain Aubrey and Doctor Maturin clearly are products of the prepared mind of a polymath—seem to have been steeped in several of them.

When an epiphany—opportunity or serendipity—occurs, action should follow. Some of us make action decisions easily, some with difficulty, some never. Timing is critical: a delayed decision may render action irrelevant; through inaction, one may place oneself at the mercy of those who have acted. I learned to make decisions by watching my father, a businessman with a large store of Scotch-Irish aphorisms. A favorite, and one to which my mentor, Ken Brinkhous (Chair, Department of Pathology, 1946-73), firmly subscribes, was, *If you tell anyone your business, pretty soon you won't have any*. Three others are relevant to my discussion:

Curiosity killed the cat meant to me that secondary effects should always be taken into account before acting. My father did not, however, always follow his own advice. Many years after his death I found that he had lost a small fortune playing the stock market in the fall of 1929. (He also used this aphorism when he did not want to answer a question.)

There is no better time to act than the present time is usually but not invariably true. The Bible recommends action "in the fulness of time," which could mean either immediately or later when the climate is better.

It is better to be damned for doing something than for doing nothing.

Dr. Graham is Alumni Distinguished Professor (Emeritus) of Pathology at UNC, where, in October 1998, he gave the seminar on which this article is based. He can be reached at CB 7525, UNC School of Medicine, Chapel Hill, NC 27599.

I want to mention 16 of the many opportunities and serendipities that presented themselves to me during my career at Chapel Hill. Some were trivial; others were important. Some I elected to pursue, others not. Some were productive, others were not. (All are described in detail in my history of the Pathology department.¹) Since the events occurred sporadically and randomly, I recount them in more or less chronological order. I do not mean to imply that only I had such experiences. Other members of the department had their own. For instance, a large photograph by Karsh on the wall of our conference room memorializes the "Partial Thromboplastin Time" test. This was a serendipitous discovery by Langdell, Wagner and Brinkhous in which I was *not* involved, and there undoubtedly were many others.

The first serendipitous event involved only me. I entered military service in WW II as a physician and a trained pathologist. Despite this, I was assigned for two years to troop duty, for which I was completely unfit. Because my work load was light, however, I had the opportunity to consider how to spend the rest of my life. I decided to spend it in Chapel Hill, from which I had received the offer of a faculty position before entering military service.

The choice of a field of research is my second example of serendipity. I had fantasized about studying the kidney, but shortly after I arrived in Chapel Hill in 1946, a new department head appeared. This was Kenneth Brinkhous, well known for his research on blood coagulation. He encouraged me to enter his field. I did, and I continued to work on the subject until retiring completely in 1989. In his 1998 Berryhill lecture,

Dr. Joe Grisham correctly pointed out that I was an experimental neophyte when I joined the UNC faculty. He failed to point out, however, that I was also the only faculty member sufficiently experienced to establish a battalion aid station within the precincts of the school, had this become necessary.

My first "opportunity" came in 1947 when we purchased a breeding stock of hemophilic dogs, which are still maintained in kennels alongside University Lake. The potential success of this venture was very high and studying them has been very fruitful.^{2,3}

The next opportunity had to do with funding our research. Ken Brinkhous saw that the state budget allocation to the medical school would support teaching, but would never support a program of "world class" research. That would require external funding. In 1948, he submitted an application for an RO-1 grant (a grant-in-aid of research) to the National Institutes of Health (NIH). Still in effect in 1998, this became the longest continuously running grant in the history of the National Heart, Lung and Blood Institute. At

Dr. Brinkhous' urging I followed suit and submitted an RO-1 application in 1953. The grant ran continuously until 1989.

Now another instance of serendipity. In 1949, the school nominated me successfully as Markle Scholar. I spent the last three months of this five-year award for young faculty as a visiting fellow at the Heredity Clinic in Ann Arbor, Michigan, an experience that completely changed my point of view. I perceived that becoming the authority on the genetics of blood coagulation was a path no one else had chosen. As a result I had no real competition in becoming "guru" in this narrow specialty until the molecular biologists caught on in the 1970s and '80s.

Another example of serendipity followed the launching of the Russian Sputnik. Americans were greatly shocked when the Sputnik began circling the Earth in 1957. Washington was in an uproar. Staff at the NIH thought that a spectacular medical triumph, such as a cure for hemophilia, would trump the Russians. The NIH sent two staff persons to Chapel Hill to try to sell us on the idea. At lunch Dr. Brinkhous, who never missed an opportunity to obtain additional funds, was

studiously equivocal while I was outspokenly negative. I argued that we could not produce what they needed soon enough for a strategic public relations checkmate of the Russians (in fact it took about 10 years). Although our visitors were unhappy, Fred Stone, their leader and later the first director of NIH's Institute of General Medical Sciences, liked the idea of a consultant who was willing to criticize half-baked NIH proposals. He invited me to join a committee examining proposals for NIH Senior Research Fellowships (later known as

Research Career Development Awards). For 14 of the next 20 years, I held committee appointments at NIH. The "pot of gold" for us lay in my frequent visits to the NIH, which let me learn very early about proposed new programs. It is very helpful to apply when a new program is announced. Competition becomes much stiffer later on.

My "sabbatical" in Ann Arbor produced another instance of serendipity: it put me in touch with the leaders of the then very small American Society of Human Genetics (ASHG). I had never taken a course in genetics, but I became familiar with the members by attending meetings and presenting papers on blood coagulation⁴ and other metabolic disorders. In 1964, the ASHG president asked me to serve as secretary of the society. This three-year appointment took a lot of time but eventually led to my election as president of the ASHG in 1972.

Now, a very important example of serendipity. In 1955, after returning from Ann Arbor, I had the chance to move my office and lab from the center of the department on the first

"Washington was in an uproar. Staff at the NIH thought that a spectacular medical triumph, such as a cure for hemophilia, would trump the Russians."

floor of MacNider Building to the fifth floor of the Old Clinic Building, three stories and about 50 yards away. Removed from the arena of routine departmental activity, I rubbed elbows with several of our school's best clinical investigators such as Judson Van Wyk, Richard Peters, and Isaac Taylor. I remained there for more than five years and began a number of joint projects with clinicians at both UNC and Duke. I was a valuable co-investigator, because no one else in either school understood how to collect, analyze, and describe medical genetic data. My field workers collected family histories and blood samples; special lab procedures were done by my collaborators; I (usually) collated the data and often wrote the papers.

Among the important successes of our lab was the discovery in 1956 of the Stuart Factor, now known as coagulation factor X.^{5,6} The discovery was entirely serendipitous. I had no inkling that a simple family study would identify the last of the factors involved in the coagulation cascade.

While detached from routine departmental affairs, I also studied the genetics of psoriasis in collaboration with dermatologists,⁷ the genetics of several thyroid conditions with Judson Van Wyk,^{8,9} and Vitamin D-resistant rickets with Bob Winters and Bernie Greenberg.⁹⁻¹⁴ The last study was a major one because it localized a gene for Vitamin D metabolism on the X-chromosome. In 1991 the 1958 monograph received the accolade of a "Classic in Medicine."¹⁵ Later, two colleagues at Duke and I examined the genetics of the most common variety of hypercholesterolemia. The resulting monograph¹⁶ antedated by six years the work of Goldstein and colleagues.

While isolated from the mainstream of the department, I conceived of a clinical coagulation laboratory in which a patient with a hemorrhagic disorder could be studied by experts. It was begun on a corner of my lab bench and a refrigerator in the hall. A part-time technician and I were the staff. Today the lab occupies several rooms in the hospital and has a dozen staff members. The peripatetic Dr. Harold Roberts claimed it was the first lab of its kind anywhere in the world. The conclusion I reached from the success of my detached service is that removing oneself from the center of the storm frees one for creative activity. This is why writers dream about primitive huts in the woods where they can write novels without distraction.

I became a geneticist by accident. Our proposal to the Markle Foundation required that I spend a period in Ann Arbor, away from my job. Because we were then raising dogs with an inherited disease, I elected to study genetics during this short sabbatical. When I returned from Ann Arbor in 1954, I jumped at the chance to teach genetics to medical students as part of the course in Pathology. It was very

challenging to teach a subject I had never studied formally, but I reckoned that I knew as much as the students, and would improve as the years passed.

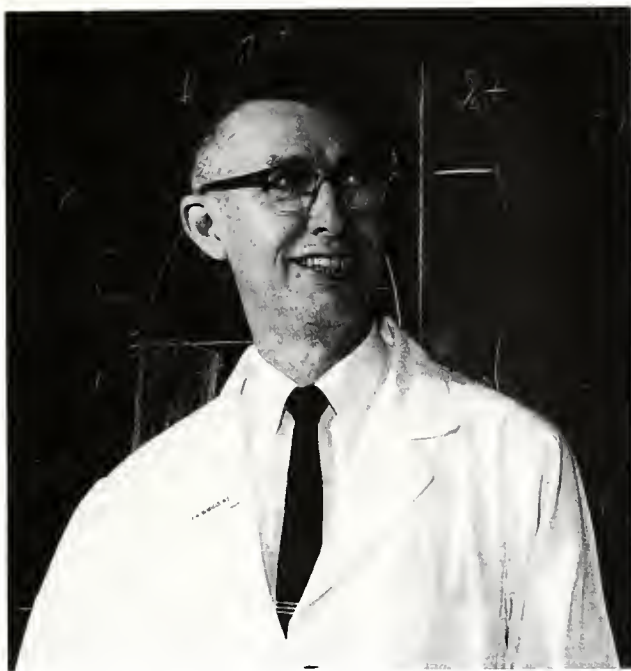
In 1960 (I believe), the NIH announced a program to train graduate students in genetics. UNC submitted a proposal with Prof. Whittinghill of Zoology as director and Dr. Pollitzer of Anatomy and myself as participants (later joined by Drs. Harry Gooder of Microbiology, Edward Glassman of Biochemistry, and Edward Barry of Botany). Friends at NIH informed me that this proposal would not be approved with Whittinghill as director because most of the training would take place in the medical school, but that if I were proposed as director, the grant would be approved. As a result, although I knew nothing about graduate education, I served as director from 1961-1985. I became a member of NIH's Genetics Training Committee the following year, then its chairman for four years. The UNC Genetics program has been funded continuously since its inception. During my era, I suspect that political considerations had something to do with our success. Today Dr. Susan Lord, the current director, competes successfully because of her program's high quality.

Financing research means seizing any opportunities. The department got a head start in NIH funding because of Ken Brinkhous' connections and stimulation. We chugged along at a modest level until 1961 when NIH Program Project Grants became available. Dr. Brinkhous' successful application greatly increased our funds. When, 8 years later, NIH Special Center of Research grants arrived, Dr. Brinkhous again applied and was again successful. These boosted our annual grant total to the

\$1.5 M level, a considerable sum 25 years ago. There was a close relation between the availability of funds and productivity measured as papers published and talks given at national meetings. We had a good staff, but it was Ken Brinkhous' driving leadership that produced this level of activity. He prodded us constantly. We grumbled, but usually followed his suggestions.

I can think of two examples of "serendipitous university service." In 1964, because of the success of the campus-wide genetics program, Chancellor Sharp asked me to bring together all the persons on the campus who were, or should be, involved in the study of human population dynamics. I spent parts of about three years getting this operation underway, meeting many social scientists and public health types, and raising several million dollars for their programs. Eventually, I turned the established program over to those who were to operate it permanently, and returned to medical school activities. Today the Carolina Population Center occupies much of the space in the office buildings in University Square. I am pleased to say that the UNC center is regarded as one of the

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Dr. Kenneth M. Brinkhous, a towering figure in the history of the Department of Pathology at the University of North Carolina. Photographed in 1967, at age 60.

nation's best for population training and research.

After leaving the population program in 1968, I became the medical school's first Associate Dean for Basic Sciences. Chris Fordham (Dean of Medicine from 1971-79; Chancellor from 1980-8) was appointed Associate Dean for Clinical Sciences at the same time. I remained in the position only two years, because I found that I was temperamentally unsuited for it. My record as Associate Dean was mixed. I recruited world-class chairmen (Stan Bennett and Ed Perl) who transformed the dormant departments of Anatomy and Physiology, but I had little else to show for my time of service except the knowledge that I was unfit for administration.

Up to this point, I have recounted events which were more or less successful. Now I describe some which were ambiguous or failed. Sometime in the 1970s, Dr. Brinkhous asked me to accept nomination as president of the American Society of Experimental Pathology. He pointed out that, if elected, I would automatically step into the presidency of the Federated Societies of Experimental Biology. This was a very long shot, (about like the chances of winning the Publisher's Clearing House Sweepstakes) but I succumbed to his temptation. Then I found that I would be running against Dr. Robert Good—a charismatic scientist who was much more widely known and respected than I. I was slaughtered. I would never have run had I known that my competition would be Bob Good!

Sometime in the 1980s, a friend in Belgium nominated me for a very substantial monetary prize to be awarded to a

physician who had done outstanding work in medical genetics. He maneuvered me into the finals, but the award went to a knighted Englishman who was editor of the *Journal of Medical Genetics*.

In the late '60s and early '70s I received a number of inquiries about chairing Pathology departments elsewhere. I discouraged these "feelers" because I had no intention of leaving Chapel Hill, and did not want to waste my time or that of others. This was probably short-sighted, since visiting and being entertained as a potential big-shot is a very pleasant way to meet interesting people. I discovered later that several of my clinical colleagues always accepted such invitations because of their social aspects and ego boost, even though they intended to stay in Chapel Hill. I guess I am just a simple-minded idealist.

During the 1970s my colleagues at Chapel Hill put my name forward for several important local positions. These included Chair of the Pathology Department, Dean of the School of Medicine, and—hold your breath—Chancellor of the University. I met with the various committees but I had no intention of accepting any of the positions. My stint as Associate Dean had taught me that I was temperamentally unfit to be an administrator. I hate hypocrisy and sycophancy, the essential lubricants of administration, and do not suffer fools gladly. The positions are stressful and boring, and are better served by those who enjoy the limelight and are willing to play the game. I have been much happier and, I think, more useful as a trouble shooter and consultant.

In 1985 I decided to retire when I discovered that my net income would be about the same retired as employed. I was 67 and tired. The Genetics training grant was up for renewal, and I felt that it was time someone younger began to carry the load. I lobbied to have my state salary used to stabilize those of a pair of my younger colleagues. Soon after retiring I saw a bumper sticker that read, *Think Globally—Act Locally*. This seemed like a good idea, so I became involved in community affairs, mostly trying to hold down taxes and prevent developers from ruining the town. My campaign score was not too bad: 2 Wins: 1 Loss.

I gave up local politics in 1993 when my wife had a severe stroke and I chose to take care of her at home. This greatly changed my style of life. I gave up going to work each day at the department. There was a serendipitous silver lining to my wife's illness, however. Staying at home allowed me to write, and since 1992 I have published three books and several historical articles. I found out that writing books is an entirely different art form from writing scientific papers. It is more complex and very hard work. And one has to help "merchandise" the product! My personal bookshelf consists of *Sand in the Gears: How We Won World War II in Spite of Ourselves*¹⁷ (a WW II memoir published in 1992 and reprinted in 1998); *How It Was: Pathology at UNC, 1896-1973*¹ (a history of the teaching of Pathology at UNC from its beginning until Dr. Brinkhous retired, published in 1996);

and *Coping with Old Age: An Odyssey*¹⁸ (the story of how my wife and I have dealt with her illness and my aging process, published in 1998).

My wife's illness forced me to learn to cook. As a result, my next book will be a cookbook for inexperienced, elderly people who have had to learn how to cook late in life. It will focus on tips and simple recipes and might even appeal to impecunious graduate students (many of the recipes call for ground beef). I have two additional books in mind: a collection of essays mostly published in the *North Carolina Medical Journal*, and an updating of the history of the department from 1973 to the present. For the latter I will have to get Drs. Grisham and McLendon to join me. This may not be easy. Neither has much of a track record in book-writing.

My most recent epiphany occurred while I was attending Francis Collins's remarkable Gottschalk lecture at UNC last spring. I sat next to Dr. Nobuyo Maeda and asked what she was currently doing. She explained that she had created, by genetic methods, a Vitamin C-deficient mouse! This is very important news because man and the guinea pig are the only Vitamin C-dependent mammals. All other mammals synthesize their own Vitamin C. Critical experiments cannot be done in man, and the abysmal state of guinea pig genetics makes them experimentally useless. Mouse genetics, on the other hand, is tops among mammals. At last we have an opportunity to test Linus Pauling's theory that megadoses of Vitamin C will prevent cancer. As I recall, Maeda said that the Vitamin C-deficient mice seemed more susceptible to certain arterial defects than wild type mice. My immediate reaction was, "Get in touch with the Florida orange juice commission. They should generously underwrite any research on Vitamin C-deficient mice." I don't know what Dr. Maeda has done, but Brinkhous or I would have been on the plane to Orlando the next day! □

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If you want the *Journal* to continue as the voice of North Carolina medicine's future as well as its past and present, read the special editorial on page 141.

When I Was Younger

Looking Back at My Residency 66 Years Ago

H. Max Schiebel, MD

I arrived in Durham, North Carolina, on June 26, 1933, fresh from the Johns Hopkins School of Medicine. I was carrying a recently dried piece of parchment indicating that H. Max Schiebel was a Doctor of Medicine. Now I had to prove it as an intern on the surgical service at Duke Hospital, the working part of Duke University's School of Medicine. It was a very, very new institution, having opened its doors just three years before. The rising senior class at Duke would not officially graduate until June of 1934, although some of those who had attended all the summer sessions would finish in December, 1933.

It was interesting to work at a new school, so informal in comparison to Hopkins. The Dean, the beloved W.C. Davison, set the tone, customarily appearing in shirt sleeves, necktie knotted an inch below his open collar. Dean Davison was also head of the Department of Pediatrics, and had formerly been in the Department of Pediatrics and Associate Dean at Hopkins. All of the department heads were Hopkins graduates: Fred Hanes in Medicine, Deryl Hart in Surgery, Ed Alyea in Urology, Al Shands in Orthopaedics, Nick Carter in Ob-Gyn, Watt Eagle in ENT, Banks Anderson in Ophthalmology, and Wiley Forbus in Pathology. All except Eagle and Carter had completed their residencies at Hopkins.

Dr. Hanes was the only really formal chairman: he had spent time in England working with Osler and others after his Hopkins days. Of the rest, Deryl Hart and Wiley Forbus were the most formal. Dr. Forbus arrived each day at exactly 9:00 AM. His office sat at the end of a long corridor, with the combination laboratories and offices of his three younger associates and house officers opening off it to either side. As

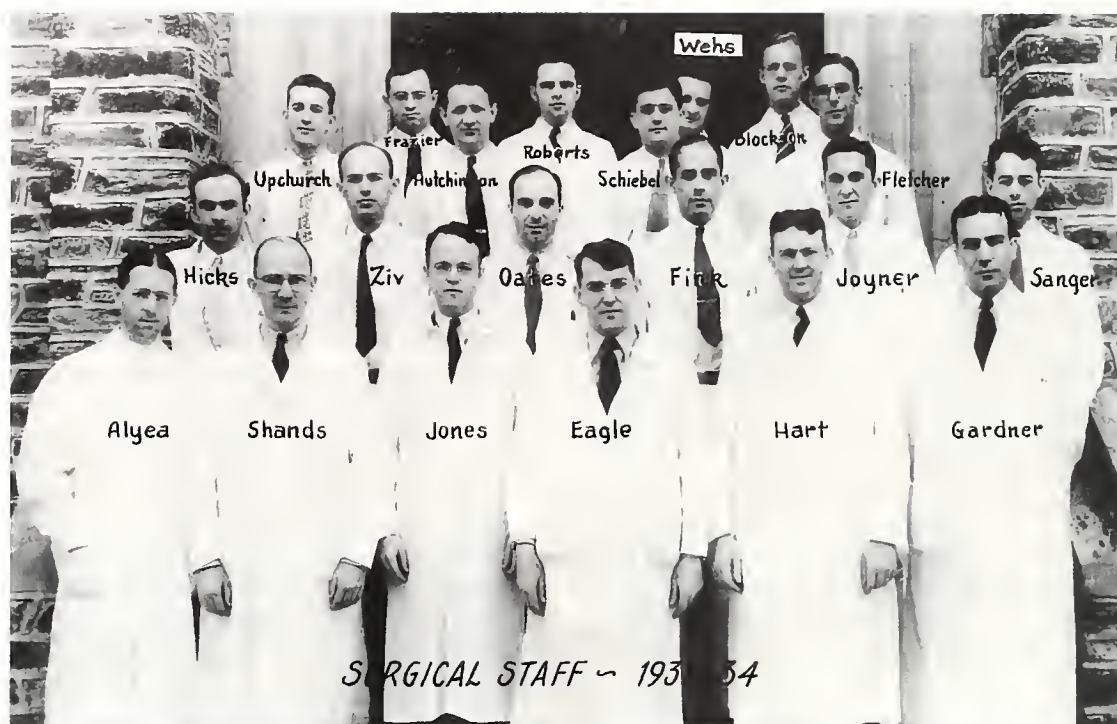
he walked down that long hall, Dr. Forbus routinely made note of who was, and who was not, at work. Dr. Hart came much earlier. He went directly to his office to remove his jacket, which always had a boutonnière—usually a rosebud—in the lapel. I later discovered that he had a very small vial fastened to the back of the lapel which kept his flower remarkably fresh all day. He usually transferred flower and vial to his white coat.

Starting My Residency

At the request of Dr. Hart, I arrived in Durham five days before the official July 1st deadline because some of the departing house officers were leaving early to travel long distances to their next training sites. At 4:00 PM on the first of July, the 10 surgical interns met Dr. Hart and several residents and staff members in the Record Library for a formal introduction to our duties, basic rules, and regulations. The one thing that stands out vividly in my mind is Dr. Hart's edict: "You are expected to be on duty the next 365 days except for your assigned two-week vacation." He later modified this by adding, "If you find a time when you are completely caught up with all your work and another house officer is willing to cover your calls, you may sign out to him for a short period of time."

None of us was married, since bachelorhood was a prerequisite to appointment as an intern. No one had a car. The hospital was out in the boondocks, the nearest house in the actual city of Durham being more than a half-mile away. There was really no place for any of us to go except the barber shop, tennis courts, Chapel, and the campus movie in Page Auditorium, which held 7:00 and 9:00 PM "shows" every Wednesday and Saturday night. Since we could be paged at the movie, we signed out for the theater with the hospital switchboard operator. I never left the Duke Campus from the 26th of June until the 12th of October.

True to his training to do many jobs at once, Dr. Schiebel practiced at Duke, Lincoln, and Watts Hospitals in Durham (as chief of surgery at the latter two) and was clinical professor of surgery at UNC-Chapel Hill from 1941 to 1989. Now retired, he lives at 1020 Anderson St., Durham, NC 27705.



Life As a House Officer

Our duties as first-year residents (we were called interns in those days) included not only the admission history and physical examination of each new patient but also performing all of the basic laboratory work. We did this under the watchful eyes of the head laboratory technician and her two associates. The "basic" lab work included measurement of blood hemoglobin, white blood cell count and differential, urinalysis, cultures of any open wounds, gastric fluid analysis if indicated, and the preparation of any special fluids for intravenous injection. We started all fluid infusions, drew blood from donors, cross-matched blood when indicated, and, when a transfusion was given, sat with the patient until it was completed. Whenever there was a fever or some other change in a patient's condition, we checked the urine and repeated the blood work, usually under orders of one of our supervising residents.

Our supervisory staff in 1933 consisted of Dr. Deryl Hart, the Professor; Dr. Clarence Gardner, Associate Professor and second in command, who came to Duke with Dr. Hart as Chief Resident in 1930 after two years on the Johns Hopkins house staff; and Dr. Robert Jones, Assistant Professor, who had had one year at Hopkins and one year at the University of Rochester. Chief Resident Harold Finklestein, an extraordinarily gifted surgeon, was a Hopkins graduate who had had one year as a house officer in surgery there.

Dr. Max Oates, another Hopkins graduate, whose father was a surgeon in West Virginia, was the only person on the house staff who had a car (a Packard Roadster) which he

guarded carefully! I never knew him to allow any other house officer to ride in it.

Dr. Hart's residency program was a pyramid competing system. Early in the second half of our first year, two of the 10 residents would be selected to remain at Duke; the other eight were on their own to transfer to wherever they could receive further training. Richard Van Fletcher and I were the fortunate ones. Sam Upchurch and Louis Roberts remained at Duke, in different fields: Upchurch in Medicine and Roberts in Pathology. Both re-applied for the residency the following year and were selected over all 12 of the 1934-35 interns. Although both were former surgical interns, their choice was not good for the service as a whole. The feeling of the entire 1934-35 group was, "I knew that I'd be competing against 11 colleagues when I accepted this position, but I didn't think that I would be competing with others from outside the group." Dr. Hart's decision affected the surgical service adversely; for several years thereafter the number of applicants for the surgical internship dropped dramatically, as the news traveled rapidly from one school to another.

Doing Two Jobs at Once

The pyramid selection process did not end after internship. In those early years the major surgical subspecialties, Orthopaedics and Urology, did not have large enough services to warrant a separate house staff. So the rotation of the two house officers who passed the first screen ran like this: each one was in charge of the Emergency Surgery service and Sur-

gical Pathology for six months; the next year, each served six months as resident in Urology and Orthopaedics. Of course, as an intern, each had rotated through those services and also ENT. At the beginning of the third year, my competitor, Richard Van Fletcher—my good friend, roommate, classmate, and fraternity brother from Hopkins—developed tuberculosis and left for a long stay at the Trudeau Sanatorium in Saranac Lake, NY. Dr. Hart asked whether I could physically manage to cover both Orthopaedics and Urology for an entire year. This would assure me of going through the remainder of the residency without competition, but Dr. Hart wanted to know whether he should seek another man who would then automatically be a competitor for the final years. It was possible for one resident to do both jobs simultaneously, because the two services alternated the use of the same operating room, three days each, and alternated afternoon clinics, with Urology holding three and Orthopaedics two each week. Of course my answer was yes. It was a very busy year, and I doubt that I ever reached my single bedroom until after midnight. By this time I had obtained a Dictaphone for my room and dictated at night. A gracious friend, the secretary to one of the medical associates, typed copy for me the next morning, and so I was able to keep everything, including the discharge summaries for which I was responsible, up to date.

In those days, there were no surgical specialties, such as Thoracic Surgery. The first successful pneumonectomy had been performed by Dr. Everett Graham of Washington University in St. Louis only in 1933. Plastic Surgery and Neurosurgery existed only at Hopkins and Yale. Training in surgical specialties was offered by only a handful of university programs (Michigan, Vanderbilt, Rochester, and UCLA) with residencies longer than two or three years. Official surgical house residencies lasted three years at the University of Pennsylvania and Harvard, after which one might possibly get a faculty appointment as Assistant Surgeon. An Assistant Surgeon supervised a ward and the three house officers assigned to it. He had the right to select any case from that ward to study on his own, to further his experience, but this could not be regarded as an official training program.

For budding surgeons it was variety, and the more the better! In our fourth year we functioned as handymen, going where we were needed. In the fifth year, every other ward surgical case on the gynecology service was ours—abdominal only, no vaginal operations. Also, by prior arrangement, every other orthopaedic case (fractures of every kind) was assigned to Surgery. Under this arrangement the first seven cases of hip fracture came to me by chance during my final year of residency. I had the opportunity to get experience with the use of a then-new device, the Smith-Peterson Nail.

In my sixth year, as Chief Resident, I was totally responsible for 90 patient beds: 30 for white men, 30 for white women, 15 for blacks (men and women), and 15 for children. The patients on these wards were operated on at the discretion

of the Chief Resident, who could decide to handle a case himself or to assign it to a subordinate. During my entire 15 months as Chief Resident, only two patients were operated on by members of the faculty. One was an infant who needed a procedure for pyloric stenosis. Dr. Clarence Gardner confided in me at the beginning of my year as Senior Resident that he had never handled a case of pyloric stenosis during his residency, the patient load being very light during the first year the hospital was open. I was happy to have him do this procedure during my tour. The other operation performed by a faculty member was on the first of three siblings, all of whom needed splenectomy for idiopathic thrombocytopenic purpura. Dr. Hart carried out the first procedure, and I performed the other two. We had only one matching blood donor for the three siblings, but we never did need to use donor blood.

At the end of my year of covering both Urology and Orthopaedics, the services had grown so much that they began to develop separate training programs. A new man came to Urology from the University of Pennsylvania, but the man from the University of Rochester chosen to head the Orthopaedics program arrived three months into the following year. Therefore, I covered for him and was the Orthopaedics resident for 15 months. Since I had substituted in Urology at Johns Hopkins in the summer between my junior and senior years in medical school, I completed more than 13 months in Urology. I performed every operation in the urological field except the transurethral resection, which had just been introduced. Dr. Alyea said all transurethral resections were reserved for him.

By time-honored protocol, the Chief Resident saw to it that each intern operated on one inguinal hernia and one case of appendicitis during his several rotations in General Surgery, the Chief or number two resident acting as first assistant. Except for those two cases, interns served as third assistant or observer during operations.

Burns: Fire and Lye

There was a plethora of burn patients on the ward, particularly black children from share-cropper families living in wood cabins heated with pot-bellied stoves, kerosene stoves, or open fireplaces. On the rare occasion that a split-thickness graft was needed, it was cut free-hand with a long, straight-bladed knife that looked much like a straight razor (the Brown dermatome did not become available until two years later.) Very few surgeons were skillful enough to do this without cutting the graft so thin that it was worthless or so thick as to require resurfacing of the donor site. Most burn victims who survived were repaired using pinch grafts in multiple stages. These grafts were performed under local anesthesia except in the case of young children. Many of these patients had third-degree burns over half of their bodies, so multiple sessions

were required to cover all the areas. There were often long delays between stages because of infection or anemia. When the burned areas involved joint or neck areas, splints were used to prevent contractures. I mention this detail because these procedures were always assigned to a second- and a first-year house officer. They were always performed in the afternoon after the major surgery had been completed.

We saw many children with horrible strictures of the esophagus. Poor families, both black and white, often boiled their laundry in large iron pots over wood fires outdoors. They usually added a small amount of lye solution, which they kept beside the pot in a soft drink bottle. Occasionally a child would take a drink from the bottle, resulting in massive mucosal destruction in the mouth, pharynx, esophagus, and even stomach. A feeding gastrostomy was needed immediately, followed by long-term dilatation of the scarred esophagus. Some eventually required replacement of the esophagus with segments of bowel.

The Lessons of Residency

Our surgical training was excellent. Dr. Hart was a superb surgeon who taught by precept. He did not like to talk while operating. We had to watch him very carefully and deduce for

ourselves why he did this or that. He did not like to be questioned about why he did such-and-such, and he expected us to understand that. In the first three years he willingly did all the most difficult and high-risk cases, even emergencies at any time of day or night. At every operation, he expected the Chief Resident to be his first assistant—a role I filled for 15 months because my predecessor left a month early and my successor, Richard Van Fletcher, did not return from his bout with tuberculosis until September instead of July. I felt very fortunate to have this extra time with Dr. Hart. He even allowed me to accept a few private patients during that time (my fee was turned over to the Department of Surgery).

Drs. Gardner and Jones were both very voluble when operating, explaining every move and constantly quizzing their assistants. Dr. Jones was interested in Plastic Surgery, and for three years I was his only first assistant. I valued my time as resident in Urology and Orthopaedics even though, as these specialties developed their own programs and boards, I gradually eliminated them from my own practice.

It was not until my sixth year, when I was Chief Resident, that married interns were accepted. We had two married interns whose wives were nurses at Watts Hospital, and these men usually covered for each other on alternate nights. There was one woman in the first class, Eleanor Easley, who graduated in 1934 and became Duke Hospital's first female intern. There were no women in the class of 1935, but one in 1936, and three in 1938.

House Officers all lived in the hospital, in what later became Meyer Ward for psychiatric in-patients. Our remuneration during the first year consisted of room, board, and laundry; during the second and third years, \$20 per month was added to our account. This rose to \$40 per month in our fourth and fifth years, and, for some reason I never fathomed, it was \$79.60 in my sixth year.

We were a happy, mostly congenial working group, and it was a good life. Lunch was the only meal served cafeteria style. For breakfast we would pick up fruit, juice, and cereal and order eggs, pancakes, etc., to be served to us at the table. Dinner, between 6:00 and 7:00 PM, was served on linen tablecloths with linen napkins. Coffee, milk, juice, and cold cereals were available until 10:00 PM. Our rooms were cleaned for us; our beds were made, and our linens changed by an orderly. Our laundry was placed in bags with an accompanying list, but when Harold Finklestein and I had earlier been on the Hopkins house staff, we threw our "whites" and other soiled personal clothing in the hallway outside our doors, later to find them washed and ironed—and even, if needed, mended—back in our bureau drawers.

Were we exploited? Perhaps we were, when you look at present salaries and work schedules. But those grueling, penniless days were wonderful training for a surgeon. Looking back now from a distance of 66 years, I see a richly rewarded time, carefree in its own way, and never to be recaptured. □



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Commentary The *Journal* asked several surgeons to comment on Dr. Schiebel's article in light of their own residency experiences. We welcome further thoughts from our readers.

As an intern in surgery at Duke in 1961-62 (I had selected an Ob-Gyn residency before entering the internship), I had the opportunity to work under many of the people Dr. Schiebel names. Clarence Gardner was chairman (I was a student when Deryl Hart was chairman), Ed Alyea was chief in Urology, and Nick Carter chief in Ob-Gyn. It was an amazing year for which I was paid the princely salary of \$25 a month (plus my uniforms and some meals). I was married, which was allowed at that time. We took call every other night; on your nights off you got home about 10 PM and had to be back at 5 AM. I had the opportunity to rotate through all the surgical specialties, but since my colleague intern developed hypertension, on at least three rotations I was the only intern. As with Dr. Schiebel, this provided a wonderful "opportunity" to learn, but an awful opportunity to work.

My wife will testify to the fatigue that set in as the year progressed. On the rotations where I worked alone, I was made "junior resident." I will admit there was little tolerance for fatigue or the amount of work expended. I, too, did routine blood counts and all the other simple laboratory studies. Most importantly, I remember that on thoracic surgery (of which I had two rotations) I had to have x-rays on the view box at the time of surgery. Since Duke's Radiology department often could not locate films, this meant crawling through overhead transoms into doctor's offices and performing a variety of other intrusive acts in search of those films—even taking patients back to x-ray at 3 AM so that we would have films for the next morning.

Dr. William Anlyan, the program director at that time, was a bright light. He accepted me on the house staff, though I was destined for another discipline, and later as Chancellor appointed me Chair of Ob-Gyn. I also remain grateful to Dr. Will Sealy, who provided ample work but also took me to Duke football games, and to Dr. Jim Schauble, my Chief Resident, an amazingly difficult man to deal with but who has my gratitude for convincing me I didn't belong in general surgery.

Perhaps I was unsuspecting or naive, but I believe these individuals all helped to teach me general surgery and its ramifications. They helped me to become a good physician. For that I thank them. For the extra work I will also thank them, with candor.

*Charles B. Hammond, MD
Chairman, Obstetrics and Gynecology
Duke University Medical Center*

Max Schiebel is a treasured member of the surgical community, the finest of his era in terms of emerging from a rigorous training program with his humor and compassion intact. In reading Max's article about internship in the 1930s, I feel privileged to have been an intern in the early 1970s, at a point of transition. Surgery being

a conservative endeavor and surgeons being conservative individuals, we maintained our traditional roles much after the "modernization" of other specialties.

In 1972 we were paid \$8,000 annually, and were expected to provide all of our uniforms, meals, etc. I am not so sure that Dr. Schiebel wasn't better off by having much of that provided for. As a surgical intern, I was routinely on call every other night and often got home after 8 PM on nights I was offcall. On some services, such as Neurosurgery, I was on call every night with only half a Saturday and a Sunday off for an entire month. I actually did that on my first rotation in July, 1972, and it was a rude shock after having been "king of the hill" as a senior medical student only a month before.

I learned that the key to successfully completing a surgery internship was the acceptance of responsibility and the absolute knowledge that one could not delegate responsibility but only authority. If you asked somebody to help you and the job wasn't performed, the fault was absolutely yours for the failure of the effort. Another life-long lesson was the importance of a daily list of things to get done. I used to prepare my list at 6 AM on morning rounds and add to it throughout the day. It was a major challenge to reduce the list to zero before I could go home. I am certain many other surgeons have gotten into trouble with their families for suggesting that wives, for example, develop their own daily check-list.

I am sure Dr. Schiebel would agree that a surgical internship is one of the defining moments in anyone's life. The bonds made with co-interns are lifelong, and I can remember much about each of the individuals with whom I interned. It was the most painful year of my life, but was also the year in which I learned the most about what it takes to be a successful physician.

*Harold C. Pillsbury, MD
Chief, Otolaryngology-Head and Neck Surgery
UNC-Chapel Hill*

I was happy to read Max Schiebel's reminiscences of his days as a house officer at Duke. It does remind me of my surgical internship at Philadelphia General Hospital in 1963-64. We also received free room and board in the hospital, along with \$105 a month. Our call schedule allowed us to be off essentially every other weekend, but the intern had to cover both Thursday and Friday to get Saturday and Sunday off. Internship was one of the great times in my professional life, and I think Max is describing some happy times in his life as well. I would be surprised in fact if others who have been through a demanding residency, where great friends were made over the years, did not feel the same.

*Walter G. Wolfe, MD
Cardiovascular and Thoracic Surgery
Duke University Medical Center*



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The Physician's Voice in North Carolina

Thomas Fanning Wood and the Beginnings of the *North Carolina Medical Journal*

Donald B. Koonce

He was 18 years old and on the verge of what he believed was a major medical breakthrough. His diligent study of the *American Journal of Pharmacopoeia* and Paroira's *Materia Medica and Therapeutics* had paid off. In his new job at Erambert's Prescription Drug Store he had become aware that oxide of silver, which was in much demand as a compound remedy, tended to break spontaneously into flames under certain circumstances. Druggists were alarmed and puzzled, some attributing the combustion to honey used in the formulas, and some claiming that fire could be retarded by the use of extract of gentian. The young man came to the conclusion that silver oxide was explosive when precipitated from a solution of silver nitrate by ammonia, but not when precipitated by a fixed alkali like soda or lime. He was thrilled with his discovery and submitted his findings to the *Medical Journal of North Carolina*. He signed it "Medical Student." The year was 1860, and the article was published—the first of many imaginative articles contributed to the *Journal* by this remarkable young man. His name was Thomas Fanning Wood, and he would soon provide the inspiration for a publication that has provided an educational forum for North Carolina physicians for over 120 years.

The First Journal

The medical journal that was the source of the young Wood's pride was published by Dr. Edward Warren, a distinguished and dedicated physician of Edenton, North Carolina. Moti-

vated by his desire to challenge physicians to abandon petty professional bickering and join their talents to further medical science in the state, Warren created the *Medical Journal of North Carolina* in 1858. He believed that the medical profession of the day was mired in mediocrity and desperately in need of a forum to share ideas and elevate standards of practice. The state also needed a universal information resource that could feed hungry minds like Wood's, and shape and inspire them to provide a brighter future for the medical profession. Warren began his venture with great enthusiasm and published a respectable journal, but he was dismayed and disappointed by the lack of support from his fellow physicians. Despite the toll on both his finances and his practice, he was determined not to let the effort fail, and the *Medical Journal of North Carolina* was published without interruption until the pressures of war led to its demise in November of 1861.

When North Carolina entered the Civil War, Thomas Fanning Wood joined the Confederate Army and saw his first action in the Seven Days Battles before Richmond. He was stricken with a severe case of Chickahominy Fever and sent to the North Carolina Hospital in Richmond. There he met Dr. Otis Manson, the Surgeon-in-Charge, who recognized Wood's interest in medicine and suggested that he attend lectures at the Virginia Medical College during his convalescence. This was a turning point in Wood's life. After only eight months he was invited to appear before the Army Board of Examiners and, after passing a grueling examination, was appointed Assistant Surgeon in the Confederate Army.

For several months he served as an army physician at the smallpox hospital in Richmond, but then was ordered to report to the Third North Carolina Regiment, Stonewall Jackson's corps, just prior to the Battle of Chancellorsville. He tended the sick, wounded, and dying of the Third Regiment through the ordeals of Gettysburg, the Wilderness, Spotsylvania, Cold Harbor and Petersburg; rode with Jubal

As son, grandson, and great-grandson of former presidents of the NC Medical Society, Mr. Koonce has a keen interest in the history of both the Society and the Journal, especially under the editorship of his great-grandfather Thomas Fanning Wood. Mr. Koonce is at 702 Pettigrew St., Greenville, SC 29601.

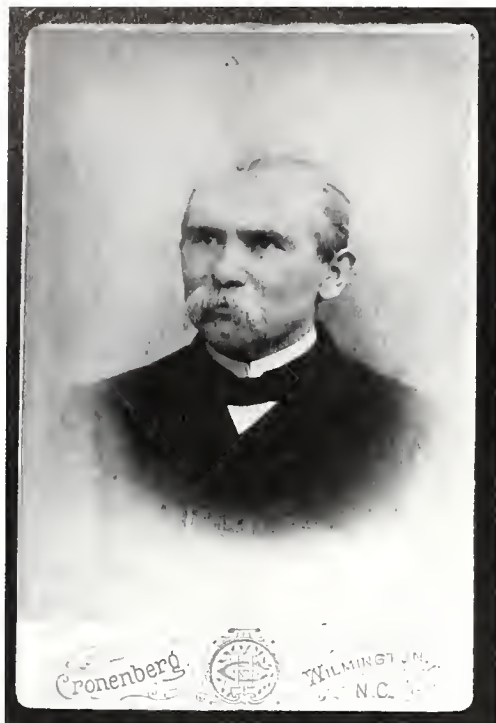


Fig 1: Dr. Thomas Fanning Wood in 1891, the year before his death. (From the Wood family collection)

Early on his raid on the Federal capitol; and finally surrendered at Appomattox, Virginia, with the 30 remaining members of the once formidable Third North Carolina.

The North Carolina to which Dr. Wood returned had been devastated by war. Occupying armies and soldiers returning to their homes brought with them typhoid, yellow fever, smallpox, and other perilous diseases, which they distributed throughout the state. The outbreak of smallpox, which had begun in the early months of the war, reached epidemic proportions by 1865. In Wilmington between October 10, 1865, and July 7, 1866, 761 persons were admitted to the hospital with smallpox. Dr. Wood, experienced with smallpox from his Richmond residency, immediately established a hospital for the sick and indigent blacks who were flooding into town. In this hospital he cared for over 1300 cases, and the impression formed by intense work with people unable to care for themselves and without means of support set him firmly on his life's mission to improve the general health and welfare of the people of North Carolina.

Dr. Wood was the 22nd member of the newly formed North Carolina Medical Society to sign its constitution in 1867. From that moment until his death, he was one of the Society's most powerful influences for good works. In 1877, after repeated petitioning by Dr. Wood, the legislature of North Carolina finally created a State Board of Health and appointed the North Carolina Medical Society the first board. One hundred dollars was appropriated annually for its opera-



Fig 2: Robert Barklay Wood and his sons, circa 1876. Thomas Fanning Wood, MD, is second from left. (Courtesy of the Cape Fear Museum, A. Jarvis Wood, Jr., collection)

tion. Dr. Wood never forgot the indelible lessons of war, and he dedicated his life to putting what he learned in field hospitals and on the front lines to use in fighting disease and illness. He spread the word about the importance of good hygiene and cleanliness to the overall health of the state. As Dr. Warren before him, he firmly believed that the continued education of medical professionals was vital to the advancement of public health, which would improve significantly only when physicians began to communicate with each other and open their thinking to new ideas.

A Rebirth

Moses John DeRosset, III, and Thomas Fanning Wood issued the first volume of the new *North Carolina Medical Journal* in 1878. It was a strictly private undertaking. Dr. DeRosset soon left North Carolina for New York, but Dr. Wood continued to edit and publish the journal from his home on the corner of Chestnut and Second Streets in Wilmington until his death in 1892. It was a family affair. Dr. Wood employed his wife, two daughters and two sons to help with the twin demanding tasks of publishing the *Journal* and running the state health department. His daughter Jane remarked (in an unpublished family memoir, 1923), "From early childhood, I understood that the health of the state came first in our household. At that time, we rather disliked the

sacrifices this financial burden entailed, but as we grew old enough to realize what my father's efforts meant to the state, we were glad and proud to cooperate." His son Edward Jenner Wood followed in his father's medical footsteps and become a famous physician in his own right, pioneering the treatment of pellagra in this country. Dr. Edward Jenner Wood served as president of the North Carolina Medical Society in 1910, 28 years after his father held the same office.

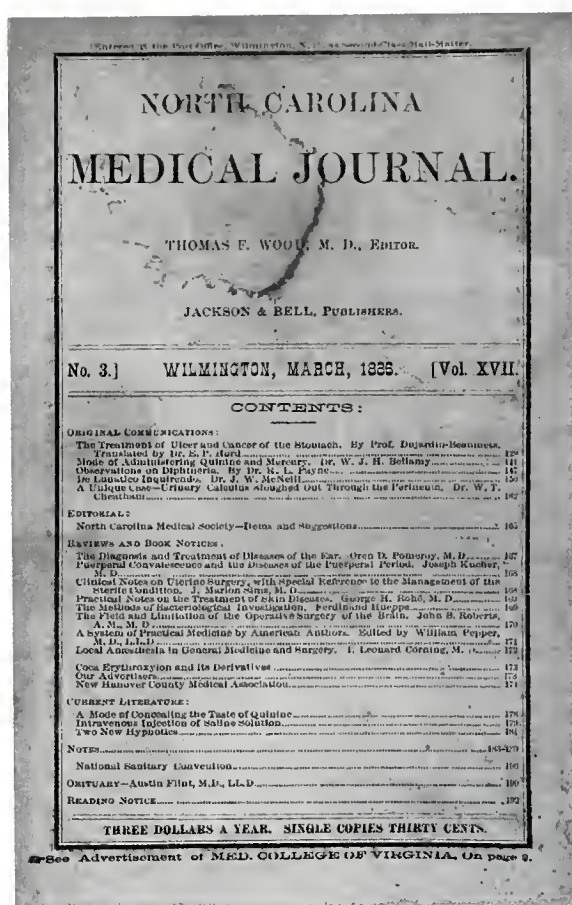
The *North Carolina Medical Journal* became a distinguished publication, with exceptional influence both within North Carolina and throughout the country. Dr. Wood's policy was to publish informative reviews of important developments in the science and practice of medicine, as well as timely reports dealing with the incidence of diseases prevalent within the state. These reports made it a valuable source of information concerning the general health of North Carolinians. From Paris, where he served as Medical Attaché in 1878, Dr. Edward Warren continued to contribute regularly, with reviews of European practices and developments, especially the results of smallpox vaccinations in France. Correspondents from all over the United States added to the medical information made available through this remarkable publication. Dr. Wood made it his goal to involve each and every physician in the state in the outreach of the publication, and succeeded in providing the opportunity for expression of the most thoughtful views on the medical science of the time. He also published the business transactions of the Medical Society and practically all of the most significant papers read before the Society.

Many of Dr. Wood's editorials were devoted to the improvement of medical practice and the elimination of "medical quackery" in North Carolina. To these ends, he argued unceasingly in support of the establishment of a board of medical examiners. Dr. Wood made medical education one of the *Journal's* pressing goals, a position that represented the most advanced thinking of the day.

The *Journal* made valuable contributions toward solving vital medical problems, including treatment and control of smallpox, typhoid fever, scarlet fever and other epidemic infectious diseases. During Dr. Wood's tenure, physicians who wrestled with the seasonal outbreaks of malaria shared ideas, through the *Journal*, about the mysteries of its cause and spread. Editorials in the *Journal* deplored the inadequacy of coroner's juries and the poor quality of autopsies done by untrained physicians. As a result, doctors became more interested in postmortem studies and worked more diligently toward perfecting the science of pathology.

The End of the Beginning

In the Spring of 1886, while climbing a steep mountainside during an inspection tour of convict camps in western North Carolina, Dr. Wood developed a symptomatic aneurysm of



the aorta. He confined himself to bed for 18 months, but continued to edit the *Journal* and prescribe for his patients while flat on his back. The editorial on the condition of convict camps appeared in the *Journal* in May 1886. On August 22, 1892, Dr. Wood died, leaving his beloved *Journal* in the capable hands of his assistant editor, Dr. George G. Thomas. Dr. Thomas said of him, "Dr. Wood was a man of high ideals and lived up to them. The aspirations of his life pervaded all of his labor. They were not the selfish ambitions of a time-server, a place-seeker. He worked for the best because it was the best as he knew it, and his strict adherence to principle was not always the popular thing to do. His career as a journalist was the result of a marked literary taste and it was signally successful. In the face of numberless obstacles and against great odds, he erected and sustained the Medical Journal of the State, and made it worthy to be the official organ of the Medical Society."

One hundred twenty-one years later, Thomas Fanning Wood's legacy perseveres. The *North Carolina Medical Journal* still provides a voice for physicians who understand the need to share ideas, pursue common goals, and document their techniques of practice so that medicine in North Carolina may be perpetually dedicated to the improvement of the general health and welfare of all North Carolinians. □

The *North Carolina Medical Journal* Finds Itself in the Vanguard of Progressive Medical Journalism

Or,
The Deputy Editor Finds His Fifteen Minutes of Fame

Edward C. Halperin, Deputy Editor

Faithful readers may remember our March/April 1997 issue. Emblazoned across the front cover were the words "Special section: Issues in the health of gay and lesbian patients. Issues in the medical education of gay and lesbian physicians." Inside were articles on primary medical care of gay or lesbian patients, the contribution of taste and smell abnormalities to the malnutrition of AIDS patients, brain biopsy for HIV-infected patients with intracranial lesions, gay and lesbian issues in graduate medical education, articles on homophobia in graduate medical education, and a dialogue by several members of medical school admissions committees on gays, lesbians, HIV infection, and admission to medical school. Over the several months after the special issue appeared, we received a number of generally favorable letters to the editor.

I was the editor of the special issue. It is our custom to have special issues of the *Journal* edited by guest editors with particular expertise or interest in the topic under discussion. Frankly, Editor-in-Chief Frank Neelon and I didn't have any luck identifying a volunteer for the task, so, in true administrative fashion, we volunteered me. My introduction to the section made it clear that I had absolutely no expertise in the subject. After all, I am a department chairman at Duke with a particular clinical interest in pediatric radiation oncology and a laboratory interest in xenotransplantation. My clinical practice involves few gay or lesbian patients and I am not gay. But I was happy to serve and to see the special issue come to fruition.

The tale I have to tell today, however, involves an interesting—and unanticipated—repercussion of the March/April 1997 issue. A few months after the issue appeared, I got

a phone call from a Ms. Marg Plum. She identified herself as a "health policy consultant" from Oakland, California. She wanted me to speak at an "important" conference in Washington, DC, jointly sponsored by the Centers for Disease Control and the Association of American Medical Colleges. The subject of the conference? "Educating medical providers about the health needs of gay and lesbian patients."

"Why in the world are you calling me?" I asked.

"Because of your fascinating and important special issue of the *North Carolina Medical Journal*," Ms. Plum replied.

"Did you actually read the special issue?" I asked. "Didn't you notice my introduction, in which I pointed out that I don't know anything about the subject?"

"Oh yes," she answered. "But we thought it was such a wonderful issue that you would have something important to say to our conference."

I thought the matter over and decided to fall back on advice my mother gave me about invitations to weddings: "If someone invites you, you go." I accepted the invitation to speak.

On the appointed day of the conference, September 11, 1998, I presented myself at Raleigh-Durham Airport. My flight arrangements had been made courtesy of the federal government. The Centers for Disease Control, as one of the sponsors of the conference, assured me that I had been "electronically ticketed"; all I needed to do was to present myself at the airport for my 6:00 AM flight. Dressed in my best business suit, and clutching my brief case, I arrived at the airport—where I encountered my boss, Chancellor for Health Affairs Ralph Synderman, waiting in line. I politely asked the Chancellor where he was headed this fine morning.

"Off to a conference of the Council of Deans of US Medical Schools," he answered. "I am the incoming chairman. And where are you going, Edward?"

Dr. Halperin is head of Radiation Oncology at Duke University Medical Center, Box 3085, Durham, NC 27710

"Where am I going? I'm, um... going, um... to a, um... conference on gay and lesbian medical education, Dr. Snyderman," I answered.

Dr. Snyderman marched up to the ticket counter and got his first class seat assignment. He waited politely at the counter while I announced that I was Edward Halperin and was ready for my electronic ticket. The ticket counter employee gave me a nonsympathetic look and told me that I had no such reservation and that I was holding up the line.

"But... but... but...," I stuttered. "I was assured that you had me electronically ticketed."

The airline employee responded with that most devastating of comments. "I am sorry, sir, but I don't have you in my system."

I have always wondered what that statement means. "I don't have you in my system." People say it as if you have committed some sort of felony. Is it *my* fault that I am not in *your* system? Anyway, I was stuck. It was 6:00 AM, I was to give a lecture in Washington at 9:00, and I didn't have a ticket. (My boss advised me, somewhat disapprovingly, that I should never have trusted the government to get my ticket right—thanks a lot!) Of course, as you might expect, the airline had a solution. For a mere \$700, I could buy an immediate round-trip airfare to Washington, DC (compared to \$180 for pay-in-advance ticketing). With Dr. Snyderman still looking on disapprovingly, I anted up \$700 with my trusty credit card.

I finally got to Washington and took a cab to the gorgeous headquarters of the Association of American Medical Colleges, in a ritzy neighborhood. There I realized what a high powered meeting I had come to: Delegations had come from Harvard Medical School, the Health Resources Service Administration, the Centers for Disease Control and Prevention, the Association of American Medical Colleges, and a number of researchers. As is *de rigueur* in Washington, there were also representatives from "interest groups," organizations lobbying for their particular views in health care. I saw representatives of the Gay and Lesbian Medical Association, the *Journal of the Gay and Lesbian Medical Association*, and the Mounter Project for Lesbians with Cancer.

There were speeches on topics like the importance of cultural competence in medicine, epidemiological studies on the current health status of lesbians and gay men, and on how to develop gay and lesbian community health programs. The most interesting paper, from my perspective, was the one about epidemiology. The authors noted that lesbian women get screening PAP smears and mammograms infrequently. This may reflect their discomfort with the health system or being made to feel ill at ease by practitioners. There also appears to be a high rate of smoking and obesity among lesbian women, possibly related to self-esteem issues.

Then it was time for my presentation. I had been asked to discuss the formation and creation of the special issue of the *North Carolina Medical Journal*. I gave a rather straight-

forward discussion about how we came up with the idea, the articles we ran, and the feedback we got from subsequent Letters to the Editor. The audience was dumbfounded. They had expected to hear about how I had heroically overcome opposition from all quarters to bring this issue to fruition. I told the audience that, in fact, the Editorial Board had approved a special issue of the *Journal* on gay and lesbian medicine as a rather routine manner, no different from its approach to other special issues on occupational health, arts and medicine, African American medicine, women's health, and the like. Our Board thought that a special issue addressing a topic that was not often discussed would be worthwhile and there wasn't any particular opposition. One member of the audience wanted to know how "a conservative state like North Carolina had been able to pull off the special issue." I told the questioner that, as far as I knew, Senator Helms was not a director of the state medical journal and that, in any event, assertive political views had nothing to do with the interest of physicians in providing quality health care to all of their patients. By the end of the session, there were congratulations all around for the magnificent work of the *North Carolina Medical Journal* and for our progressive, crusading journalistic stand.

I suppose that one moral of my story is that many people cultivate the victim mentality and then are disappointed when you don't have a victimization tale to tell. I also think that another, more important, moral is that sometimes just by doing your job you can do some real good in the world. I was glad that we had run the special issue on gay and lesbian medicine. We had touched on a topic that hadn't been discussed much in the general medical literature. I was proud to be part of a Medical Society that sponsored, at least this time, a journal held up as a paragon of virtue in presenting information not otherwise available in the medical literature.

(And, in case you were wondering, I did eventually get reimbursed by the government for the money I had to lay out for the plane ticket—but it took them six months to do it.) □

Our Deputy Editor
is not the only crusader.
On page 141, a rallying cry
from the Editor.

**WHEN YOU HAVE MS YOU
MIGHT NOT SEE TOMORROW.**

YOU OPEN YOUR EYES. YOU CAN HARDLY SEE. AND YOU REALIZE IT'S HAPPENED AGAIN, YOU'RE BLIND. THAT'S HOW MULTIPLE SCLEROSIS WORKS. IT'S UNPREDICTABLE. MS RANDOMLY ATTACKS YOUR NERVOUS SYSTEM AND CAN BLIND OR PARALYZE YOU AT ANY TIME. THE FIRST SIGNS ARE USUALLY SEEN BETWEEN THE AGES OF 20 AND 40 BUT THE NOT KNOWING ALWAYS STAYS WITH YOU. THE NATIONAL MS SOCIETY IS THE LEADER IN RESEARCH AND SERVICES FOR THOSE WITH THE DISEASE. CALL US AT 1-800-FIGHT-MS. WITH YOUR HELP WE KNOW A CURE IS IN SIGHT.

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HELP WANTED! HELP WANTED! HELP WANTED!

State medical journals are an increasingly rare (and, I believe, precious) commodity. Over the past decade, the scholarly journals once published by state medical societies in New York, Ohio, Pennsylvania, Florida, and Virginia have vanished, taking with them an irreplaceable voice for practicing doctors, students, academics, and residents. The usual explanation for these departures is that each society's leaders developed a new vision of the place and role of the medical society in a world of "modern medicine." Readers of Don Koonce's article (p. 135) will realize that the roots of this problem are long-lived and unlikely to go away.

When the Society's House of Delegates voted last November to discontinue the *Journal's* subsidy from annual membership dues, it put us squarely on the list of endangered species. We, too, can fade away like so many other journals—or we can rise like Phoenix, funded in new ways. **You** can help make the difference.

Here is the financial summary of the *Journal's* operation. Last year it cost about \$140,000 to publish 6 issues of about 11,000 copies each; we received about \$35,000 in net advertising revenue. In the absence of an allocation from members' annual dues, in 2000 the *Journal* will need to raise about \$105,000. Where will that come from? The

Editorial Board has been actively exploring sources of revenue including foundation grants, collaboration with the Institute of Medicine, and individual contributions. To date we have over \$16,000 in hand (including more than \$10,000 from Dr. Eugene A. Stead), and we have pledges for \$15,000 more. Still, we have far to go, and little time.

Eventually, the *Journal* would be best served by a dedicated endowment, the interest from which would support operation. That goal is in the sights of the Task Force appointed by President Rust to help find funds for the *Journal*. For the moment, though, we need **your** help with the operating fund, and we need help right now. If 1000 members contributed \$100 (or 4000 contributed \$25) we would be solvent. That is a reasonable, reachable goal. We know we can do it. Please send your contribution today. Call us if you have other fund-raising ideas.

We need the support of all readers and friends of the *Journal*. Send your tax-deductible donation by check (designated "for publication of the NC Medical Journal") to the NCMS Foundation at PO Box 27167, Raleigh, NC 27611. Contributions of appreciated stock or real property can have substantial financial benefits for the donor, and we would be glad to discuss this with those interested.

—Francis A. Neelon, MD, Editor

Truth-Telling and Hope

The Dilemma of Modern Medicine

William G. Porter, MD

I have been both an oncologist and a primary care physician for almost three decades—work that in turn has led me to an interest in bioethics. I want to share with you from that perspective my perplexity about how best to deliver bad news, about how we care-givers can best help and comfort patients for whom cure is not a realistic goal, but who do not want to die, are not ready to die, who want us to find a way to cure them. What do we say to them, and how shall we say it? How can we both tell them the truth and give them hope? Although I write this from an oncological and ethical perspective, I hope I can convince you that the primary care physician plays an indispensable role in communicating with and caring for these patients and their loved ones.

These are exciting times for oncology. Every day, it seems, new discoveries bolster the wide-spread optimism, which I share, that we are on the verge of finally understanding and conquering cancer. In the meantime, it is useful to remind ourselves that we have declared war on cancer several times already, and while progress is undeniable, only half of the 1.2 million Americans who developed cancer in 1998 will be cured by currently available methods.

Ironically, it is the unusual cancers we are best able to treat; although early detection has led to progress against many common malignancies, once metastatic they almost always resist cure. As the Harvard oncologist Jerome Groopman wrote in *The New Yorker*, "In the almost three decades since a war on cancer was proclaimed, most of the advances have been disappointingly incremental. Only recently has there been a sense that strides, and not just steps, are being made. For all the talk of 'breakthroughs,' however, the clinical realities continue to mock our dreams and adhere to a grim equation: the stronger the cancer, the more punishing the treatment."¹

The patients I want to consider are the ones who at the

time of diagnosis have advanced disease for which there is little if any effective treatment, or who have metastatic disease no longer responsive to treatment. These are patients who need the skills of both oncologists and primary care physicians. Treating them successfully is as much a measure of our progress against cancer as is the latest chemotherapy.

A Clinical Story

By way of example, let me tell you about one of my patients, a man in his mid-forties whom I'll call Jim. A high school principal, Jim was bright, out-going, and robust. His wife, Beth, a psychological counselor, was equally intelligent and well informed. They were members of our social circle, of similar political persuasion, and—I thought—supremely cool-headed, analytical, rational people. But physicians know that past behavior is no guide as to how any of us will respond to life-threatening illness, so I should not have been surprised at the way Jim and Beth behaved when Jim got sick. He came to see me in the office one afternoon, complaining of vague digestive symptoms and low-grade mid-abdominal pain. His appetite was off, and he had lost some weight. On physical examination there was mild enlargement of the liver and some ascites. At laparotomy we found advanced, inoperable cancer of the stomach; his omentum was caked with tumor and there were several metastases in the liver.

There is not much that can be done to prolong life in situations like Jim's. Palliative surgery for bleeding or obstruction, maybe. In a small percentage of cases, chemotherapy may transiently relieve symptoms, but there is only marginal increase in survival, and that at considerable cost in terms of side effects, time, and quality of life. I dreaded having to tell Jim and Beth all this, but I knew I had to. I sat down with them the day after surgery to tell them, in essence, that Jim's disease was beyond effective treatment. Available chemotherapy was not curative, the response rates were low, and the toxicity was considerable. I did not recommend treatment, although we might want to try this in future if

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complications arose that warranted it. For the present, it seemed best for Jim to try to live as comfortably and fully as possible. We would make every effort to keep Jim pain-free and relieve as best we could what symptoms might develop. I would stick by him.

I asked if there were questions, but they were too stunned to come up with any, so I left. When I came back the next day, the atmosphere in the room was altogether different. Shock and disbelief had been replaced by defiant resolve.

"You've given up on Jim, but we haven't. We've de-

"I tell you this story because it, and others like it, have troubled me for many years. I still do not know how to make them end differently."

cided to fight this thing and beat it." Beth said. "We'd like another opinion."

"Of course," I said. "Did you have anyone in particular in mind?"

"Yes, we'd like to see Dr. Jones," they said, naming a prominent local oncologist.

So I called Dr. Jones and asked him to consult. Knowing what he would hear from Jim and Beth, I told him what I had recommended, but asked him not to let that influence his opinion. Perhaps it did, perhaps not, but Dr. Jones gave Jim and Beth the same advice I had. He was willing to give chemotherapy with the understanding that it would be at best palliative, not curative. Jim and Beth found Dr. Jones' assessment and advice unacceptably gloomy.

"We want to go to XYZ Cancer Center and see Dr. Smith," Beth said. "He's been recommended by friends."

Dr. Smith, it turned out, used high-dose chemotherapy and autologous bone marrow transplantation to treat certain kinds of lymphomas, but he had never successfully treated a chemotherapy-resistant solid tumor like Jim's. Despite this, Jim and Beth went to see Dr. Smith and came back home full of hope and high expectations. I'll never forget Beth's ebullience when she told me, "Dr. Smith says he's going to hit a home run with Jim." She went on to describe the plan: conventional doses of chemotherapy with three drugs used to palliate stomach cancer: if remission occurred, then Jim would get high doses of chemotherapy and a bone marrow transplant. It all sounded so logical.

That's the thing about most cancer treatment protocols: they have unassailable logical underpinnings, but many of them just don't work. And it did not work for Jim. No home run; not even a bunt single. He did not respond to the chemotherapy, except to get sick from it. When Dr. Smith acknowledged that things were getting worse, not better, Jim

Commentary

Memorial Lectures for a Medical Humanitarian

Howard Eisenson, MD, Duke Community & Family Medicine; Medical Director, Duke Diet and Fitness Center; Coordinator, Goldstein Lectures

Dr. Porter's paper was presented at Duke University Medical Center on October 3, 1998, as a *Jared Haft Goldstein Memorial Lecture on Ethics and Values in the Practice of Medicine*. This series is supported by a memorial fund established by Dr. Goldstein's family, friends, patients, and members of his community to further his work of exploring and promoting the synthesis of the humanities and medicine.

Born in Wilkesburg, Pennsylvania on April 5, 1952, Jared Goldstein graduated from Rensselaer Polytechnic Institute and Albany Medical College in New York, and trained in family medicine at the University of Texas Medical Branch at Galveston. His early interest in the humanities stayed with him through his medical training and years of practice in Randolph County, NC, where he established the Randleman Family Health Center in 1979. He studied and wrote about the importance of reflection, empathy, respect, and caring in medical practice, and his work with his own patients exemplified these values. At a time when many physicians were enrolling in part-time MBA programs, Dr. Goldstein was pursuing his Master of Arts degree in Liberal Studies at Duke. He never completed the program. Diagnosed with an aggressive cancer in 1991, he died less than a month later, at the age of 39.

The first lectures were presented in Asheboro, NC, in 1992. In 1998 they were moved to Duke, to make them more accessible to students. Lectures have covered topics ranging from "The Health Care Arts Movement: Models for a New Arts-Medicine Partnership," by Janice Palmer, Director of the Office of Cultural Services at Duke, to "Empathy and the Practice of Medicine," by Dr. Howard Spiro, Director of the Program for Humanities in Medicine at Yale. At least one, my paper on "Patient-Centered Care: A Collaborative Approach," has appeared in these pages (NC Med J 1997:58:18-22).

Dr. Porter's paper illustrates the importance of a caring, respectful doctor-patient relationship, even when a cure is not possible, and is an excellent example of the kind of discourse the Goldstein Lectures hope to promote. It is anticipated that the Lectures will be integrated with an existing series at Duke on the Humanities in Medicine. We hope that the series will grow in popularity and that more students and practitioners in the health care field, as well as members of the general community, will attend and participate in the discussions. We hope also that readers of the *Journal* will see more papers from the Goldstein Lectures in the future.

and Beth concluded that it was time to stop looking for a cure and start trying to make the best use of the time Jim had left. And they did, right up until the time Jim, with the help of Hospice, died quietly at home several weeks later.

I tell you this story because it, and others like it, have troubled me for many years. I still do not know how to make them end differently. I still ask myself whether I was a help or a hindrance to Jim and Beth. I still wonder whether Dr. Smith's advice was right or wrong—or helpful—or whether he told Jim and Beth the truth. Certainly he gave them hope, but was it legitimate or false hope? Was what Beth and Jim heard from Dr. Smith what Dr. Smith actually said? Or did some psychological filter let them hear nothing of his message but good news? No doubt Jim signed a consent form, but did he read and understand the risks and benefits of the treatment protocol, or did he hear and understand only Dr. Smith's optimistic prognosis, couched in an unforgettable baseball metaphor? Part of the problem, of course, is one of perspective.

I find cases like Jim's both ethically and oncologically problematic. All physicians try to be empathic, to relate to our patients in ways that acknowledge and accommodate their values and expectations. But even the most empathic physicians cannot always anticipate, much less completely understand, how patients newly confronted with the prospect of death will react, and what decisions they will make. So my analysis of Jim's case unavoidably risks obscuring the central

directly (by recommending toxic yet ineffective treatments or failing to provide attentive palliative care) or indirectly (by being so intent on telling the truth that we drive patients into the arms of alternative and nonscientific practitioners who thrive on desperation)?

Interestingly, nothing in the Hippocratic Oath, or the other oaths physicians take, requires us to tell the truth. Yet today in this country we take it for granted that physicians will tell patients the truth; there really isn't much debate about doing so. But it is useful to remember how recently it became the norm to speak truthfully to patients with advanced cancer, or for that matter, how recently physicians have even used the word "cancer" openly with patients. In many countries, patients still aren't told that they have incurable cancer. The family is told of the fatal diagnosis, but the patient is given an ambiguous or falsely optimistic report about the outcome of surgery or diagnostic tests. Of course, the patient usually figures things out as health deteriorates, but the doctor even then may continue a degree of deception that is both unethical and unwise. In the interests of preserving hope, the patient is deprived of the opportunity to prepare for death, to say goodbye, to clarify and repair damaged relationships, to accomplish the kinds of closure that can bring serenity and hope to the dying. But there is no need to belabor this scenario, since it is not the way things are done in this country, where truth-telling, a crucial element of informed consent, is the cornerstone of modern bioethics and of the doctor-patient relationship.

"We know that patients want to be told the truth. In a 1982 Harris poll, 96% of people said they wanted to be told if they had cancer and 85% wanted to be told the truth if they were dying."

reality that it was Jim's life, not mine, that was about to end. Do I really know how I will respond when a doctor tells me that my own death is imminent? Does anyone?

Truth and Hope: Dilemma of Modern Medicine

Truth-telling resides at the very center of modern bioethics, in the principles of autonomy and nonmaleficence (not doing harm). To give dying patients hope, yet to tell them the truth, represents a dilemma of competing virtues which must be reconciled. How can we best do both? And how can we best heed Hippocrates's caution to do no harm to patients, either

Informed Consent

Let's look at the nature of informed consent in more detail. Out of the social ferment of the 1960s—the civil rights movement, the women's movement, the consumer movement—came a rejection of medical paternalism. Medical progress had advanced; miracles abounded; no problem, it seemed, was too daunting for modern medicine. In this environment of rising expectations, the doctrine of informed consent arose. No longer was it sufficient, or acceptable, for physicians to tell patients only what, in their judgment, patients should know or do, without adequate explanation. Rather, patients must be told—in language they could understand—what was wrong, what interventions were proposed, what were the benefits and risks. And patients must have a chance to have their questions answered.

Legally, informed consent is anchored in four postulates: (1) Patients are generally ignorant of medicine. (2) Patients have a right to control their own bodies and thus to decide about medical treatment. (3) To be effective, consent to treatment must be informed. (4) Patients depend on their physicians for truthful information and therefore must trust them (making the doctor-patient relationship "fiduciary" rather than "arms-length"). We owe it to patients to explain

to them both the probability of success of proposed treatments and the meaning of success. George Annas, an attorney who writes frequently about ethical and legal issues in health care, says that critically ill patients for whom treatment is recommended must be told "the success rate of the proposed treatment in terms of both the prospects for long-term survival and quality of life."² Without this information, it is the physician, not the patient, who makes the treatment decision—precisely what the doctrine of informed consent is designed to prevent.

How well do we do in telling patients with incurable cancer the truth about their prognosis? We know that patients want to be told the truth. In a 1982 Harris poll, 96% of people said they wanted to be told if they had cancer and 85% wanted to be told the truth if they were dying. That goal is not always achieved, as evidenced by the Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments (SUPPORT), a multi-institutional, ongoing investigation of medical decision-making near the end of life.³ The study investigated whether patients' decisions to accept life-extending treatments were predicated on a realistic understanding of their prognoses (that is, how long they could be expected to live). Patients hospitalized for treatment of Stage III or IV nonsmall-cell lung cancer or colon cancer with liver metastases were asked, *Are the chances that you will live for 2 months or more if the current plan of care stays the same: 90% or better? about 75%? about 50-50? about 25%? 10% or less? Don't know?* They also were asked, *What are the chances you will live about 6 months or more? and If you had to make a choice at this time, would you prefer a course of treatment that focuses on extending life as much as possible, even if it means having more pain and discomfort, or would you want a plan of care that focuses on relieving pain and discomfort, even if that means not living as long?* The patients' primary physicians were asked to estimate the likelihood of survival at six months as a percentage varying from 0% to 100%.

There were several salient findings and conclusions:

(1) Eighty-two percent of cancer patients overestimated their survival, 59% decidedly so; physician estimates were more accurate.

(2) Patients who thought they would live six months were twice as likely to choose life-extending therapy as those whose self-estimates were less optimistic. The most fundamental medical choice patients with incurable cancer face—the decision between life-extending therapy and comfort care—is highly influenced by their understanding of their prognosis.

(3) The over-optimistic patients *did* live longer, but their survival was independent of whether they received aggressive or palliative care. This suggests a prognosis-improving potential of hope itself, and possibly a placebo effect of chemotherapy, although I know of no experimental evidence on this point.

(4) Patients who chose life-extending therapy were more likely to undergo aggressive treatment, and, although their six-month survival was no better than those who got only supportive treatment, they were 1.6 times more likely to have a hospital readmission, undergo attempted resuscitation, or die while receiving assisted ventilation.

(5) Suffering at the end of life can be diminished by better communication about prognosis.

The SUPPORT findings hint at something all of us have observed; namely, that hope itself can prolong life. Patients who want and expect to live as long as possible, or to reach some milestone event—the birth of a grandchild, the arrival of a distant loved one—often achieve that goal, outliving their prognosis by days or weeks. This achievement does not depend on disease-specific treatments like chemotherapy.

Hope Against Despair

What makes some people so much more hopeful than others? I recently read about someone who had "the habit of hope," that is to say, an unself-conscious expectation that his life would continue indefinitely on a more or less satisfactory trajectory. I think this is true for most of us. We get up every morning and set about the day's tasks assuming that no fateful disruptions will occur. Central to this kind of hope is a sense that there is a future, what Sherwin Newland, in his essay "Hope and the Cancer Patient," calls "the expectation of a good that is yet to be."⁴ It is precisely this expectation that is threatened by incurable illness. There is a future, but the patient will not be a part of it. Death is no longer abstract and

"How many times family members have come to me . . . and said, 'If we had only known how sick it was going to make her, we would never have put her through it.'"

distant but a looming reality from whose clutches there is no escape. And so patients turn to physicians for help, for rescue, to be saved from dying, rather like the ship-wrecked sailor who, as Ovid said, "hopefully strikes out with his arms in the midst of the sea, even though on all sides he can see no land." When rescue is not possible, the physician's task is to tell the truth, and to preserve hope of another kind. Not to prevent death, which is not possible, but to prevent death with despair, a word which literally means "without hope."

Obviously, this is easier said than done. The case of Jim and Beth is but one example of how difficult this task can be.

Let's look at what happened again to see if there were ways that I and the potential home-run hitter, Dr. Smith, might have done a better job of preserving hope. First of all, after outlining the inadequacy of conventional therapy, I could have spent more time explaining clinical trials and experimental therapy. Such trials are divided into Phase One, in which new treatments are tested, usually in patients who have failed conventional therapy; Phase Two, during which dose schedules and toxicity are studied; and Phase Three, in which new treatments are compared to conventional treatment, either alone or in innovative combinations with currently available therapies.

Progress in oncology depends on testing new drugs in clinical trials. We should encourage patients to enter Phase Three trials that compare two or more active regimens. And, when there is no other effective conventional treatment, patients should have the opportunity to enroll in Phase One or Two studies that test new treatments for activity and toxicity. But in all cases only after the patient has given meaningful informed consent, which I'm not sure Dr. Smith obtained from Jim. Some patients will participate because they feel that "doing something" is always preferable to "doing nothing." They will try anything, go anywhere, grasp at the smallest chance to extend their lives. Others want to serve as "guinea pigs" in the fight against cancer, knowing that treatment is unlikely to help them but will advance scientific knowledge. Successful techniques like bone marrow transplantation evolved from the lessons of repeated failures, every one of which was accompanied by a great deal of suffering prior to death. We can admire and encourage this kind of altruism, borne on the wings of hope, but it must proceed out of a realistic knowledge of risks and benefits—out of truly informed consent, encompassing not just the theoretical rationale for potential benefit but the results in other patients: response rates, side effects, quality of life, the probability of success, and the meaning of success.

When Jim got sick, the probability of a successful bone marrow transplantation for stomach cancer was minuscule. Today it is not even tried for malignancies resistant to chemotherapy, and in cases where it has some chance of success the morbidity and mortality remain distressingly high. As Jerome Groopman writes, "We can only hope that in another decade or so [bone marrow transplantation] will have become obsolete, because something more effective and less punishing has taken its place."¹ What Groopman is getting at, what Maxwell Wintrobe, one of the fathers of hematology, was getting at 25 years ago when he described chemotherapy for acute leukemia as a kind of "therapeutic barbarism," is an awareness that patients with cancer often suffer as much from their treatment as from their disease. A doctor friend of mine told me recently about his brother's death from bladder cancer. "He was getting along pretty well and looked pretty good until somebody persuaded him to try some chemotherapy. Then his hair came out, his mouth got sore, he quit

eating, he had no energy. For the first time he looked like somebody who had cancer." We are all familiar with that look. It is all too common in our waiting rooms and hospital beds. Most of us would endure that kind of suffering, would be willing to impose it on our patients, if it achieved cure or extended enjoyable life. But we balk at just doing something instead of doing nothing, as the choice is so often mistakenly framed. How many times family members have come to me after a loved one has died and said, "If we had only known how sick it was going to make her, we would never have put her through it."

"No wonder we now have yet another stranger at the bedside—the 'medical options professional'—offering to help cancer patients decide what to do."

Researchers who recruit patients for Phase One and Two trials need to be clear about the risks and benefits. I remember a young woman from my practice who developed small-cell lung cancer while still in her thirties. At the time of diagnosis, she went to a nationally recognized cancer center, one of whose oncologists directed the chemotherapy, which I administered. When it failed and the cancer relapsed, Gretchen wanted to go back to the cancer center. I shall always remember the call I made to the center late one Friday afternoon. I explained the clinical situation and Gretchen's desire for more treatment.

"All we have left are some Phase One drugs," the consultant told me. "We could offer her one of those."

"And how will you choose the drug to try?" I asked.

"Well," he replied, "we give each new drug to 12 patients. If there are any responses, we consider it for Phase Two trials."

"And have you had any responses to the drug you will give Gretchen?"

"None so far. In fact, we haven't seen any activity from any of the drugs we've been testing in lung cancer. A lot of people get sick, but their tumors don't regress."

"What do you think Gretchen should do?"

"If it were me or my wife, I'd tell her to stay home. I don't think we have much to offer, and nobody else does either."

Of course, Gretchen wasn't he or his wife—or my wife. Gretchen was Gretchen, and she opted to try the Phase One drug rather than "give up." That's the thing about bioethics, specifically autonomy and informed consent. The Golden Rule isn't all that reliable a guide. The fact that I would not take a drug myself should not disqualify my patient from chancing it. I've always been grateful for my consultant's

candor in Gretchen's case. It would have been easy for him to give me the "party line," and recruit one more patient, one more point for the data set of the trial he was conducting. Too many academic oncologists, I fear, exploit the needs and expectations of desperate patients to bolster their research or the priorities of their institutions. Of course, there are analogous incentives, largely economic, for oncologists in private practice to recommend chemotherapy.

What to Do When 'There's Nothing We Can Do'

But back to Jim and how I might better have served him. Had he rejected experimental therapy, should I have been more enthusiastic about conventional therapy, hoping that he would tolerate it well and be one of those rare patients who achieve durable responses to it? That is what many oncologists would have done. But I am still not sure it would have been the right thing to do. And here is where I believe the primary care physician has a role to play. Oncologists, after all, are in the business of treating cancer. That is what they do. As one of my primary care colleagues put it, asking an oncologist whether a cancer patient needs chemotherapy is like asking a peach grower whether you should eat peaches. Well, it's not quite that bad, but it is true that most oncologists are enthusiasts for chemotherapy, even when its benefits are difficult to find.

Remember the setting in which most oncology consultations take place: A patient with newly diagnosed or recurrent cancer is confronted by a stranger on whose expertise and wise counsel the future suddenly depends. The oncologist, on the other hand, sees a patient whose prognosis may range from dismal to potentially curable, and for whom the potential benefits of treatment range from marginal to dramatic. The patient counts on the oncologist for rescue, and the oncologist doesn't want to let the patient down. Out of this dynamic, it is easy to understand why the decision is to "try" chemotherapy rather than settle for comfort measures, even when the chances of success are slim and the definition of success problematic.

There is another dynamic at work in the oncological consultation, namely the relationship between primary care physicians and specialists. Much has been made about this relationship in the context of managed care where gatekeeper primary care physicians control access to specialists, but that is not what I'm getting at. Rather, I mean the tendency of primary care physicians to accept uncritically the recommendations of consultants. A medical school classmate of mine, a neurosurgeon, recently told me, "Twenty years ago, when I got a consultation from a family practitioner, I knew he wanted my opinion. Nowadays, he wants me to operate." What he was getting at, I think, is the willingness of primary care physicians to go along with whatever recommendations

the consultant makes, rather than interpreting them in the context of the patient's values, expectations, and understanding of diagnosis and prognosis. It is our job as the physicians who have known the patient longest and best to explain the consultant's recommendations to the patient. Anatole Broyard, the literary critic who died several years ago of prostate cancer, wrote in his memoir *Intoxicated by My Illness* that he wanted a physician to be his "Virgil, leading me through my purgatory or inferno, pointing out the sights as we go."⁵

We have to help cancer patients and their families see "the big picture," help them sort out the advice they get from the medical oncologist, the surgical oncologist, the radiation oncologist, the pain management specialist, the oncological psychiatrist, and all the other "strangers at the bedside," including the well-meaning friends who bring books, articles, anecdotes, and the latest Internet chat about unconventional ways to treat cancer. No wonder we now have yet another stranger at the bedside—the "medical options professional"—offering to help cancer patients decide what to do. I believe that primary care physicians are better qualified to do this than "medical options specialists" with their laptops and modems. That is not to say that oncologists don't tell the truth, but in this post-modern era we have to acknowledge the relativity of the "truth" they tell, and we primary care physicians must be prepared to help interpret what they say, to conduct the chorus of advising voices, assuring the accuracy of pitch and tone of each one. This means that we have to know a lot about our patients and a lot about cancer, which sometimes isn't as easy. But it can be done.

Another way for the primary care physician to help patients with incurable cancer is by promising to stick by them and keeping that promise. Oncologists are very good at treating cancer, the disease, but they do not always stick around after the chemotherapy has been given and stopped working. In *Vigil*,⁶ poet Alan Shapiro's memoir of his sister's death from breast cancer, Shapiro tells how the oncologist lost interest once his sister's cancer became resistant to treatment. Not only that, when she responded to treatment, the oncologist was "proud" of her; when she stopped responding, she became a "treatment failure": not someone whom the treatment had failed, but someone who had failed the treatment. Like other subspecialists, Shapiro says, oncologists are conditioned by training as well as temperament to perceive their patients as problems to be solved or riddles to be mastered rather than people to be cared for. If he is right, the role of the primary care physician is even more critical—not just advocate and counselor but somebody to be counted on even after "treatment" stops working, somebody who brings the same precision and attention to detail to the equally demanding and important task of palliative care, upon which depends the quality of the final days and weeks of life.

As Eric Cassell points out in his new book, *Doctoring, The Nature of Primary Care Medicine*,⁷ primary care physicians of the next century will devote most of their time to

patients with disorders that have no real cure. Relief of symptoms will increasingly occupy our time, as it should, for the highest goal of medicine is not to prevent death, which we cannot do, but to restore health. And, when this is not possible, to relieve suffering, not compound it with toxic and ineffective treatments.

The Testimony of Friends

As I worked on this paper, pecking away on my laptop in the attic of our Nantucket home, inquisitive visitors, friends of my wife, would ask what I was doing. When I told them, many related their own experiences with cancer. I was amazed at how many had been touched by the illness in one way or another. One woman told me about her husband's death from a malignant brain tumor a mere 19 days after diagnosis. "The doctors at Mass General [Hospital] were wonderful; they were up front from the beginning. We knew what to expect, and that made it so much easier." Another brought me her copy of *The Tibetan Book of Living and Dying*, which had helped her interpret and recover from her mother's death. Still another found solace in her religion and in the spirituality of her physician.

Another friend had undergone high-dose chemotherapy and stem cell rescue for amyloidosis. She is doing fine, though evidence of her mysterious disease persists on all

follow-up tests. "I'm not sure I could go through the treatment again. I was so tired, so weak, for so long," she told me. Yet she remains convinced that the treatment has helped her, as surely it has. Just as surely, her resolve will be tested again when her disease progresses. And I hope she will choose further treatment, because she has a good chance of responding again, enough to make the side effects of treatment worth the risk. It is just as lamentable to see patients give up too soon, to reject treatment that stands a good chance of helping them, as it is to see them grasp at futile treatment.

All these friends, all our dying patients, find hope in any number of ways. Our task as doctors—our opportunity really—is, as my friend said, to be "up front" with them, to comfort them so they can define their own hope. After my friend and patient Jim had accepted Hospice care, he and I were watching the NBA finals on television at his home one night. Detroit was playing Los Angeles, and for some reason I was pulling for the Lakers. Jim was for Detroit.

"Why?" I asked him.

"Oh," he said, "Detroit's a city that needs a boost."

That's the kind of guy Jim was. A guy who had spent his life boosting other people. He was dying, but not dying in despair. Because of the life he had led, Jim had a sense of a future where his memory, his example, his ideals would go on boosting his city, his students, and all of us who loved him. Virgil said, "Let every man's hope be in himself." Let it be in the life we lead and the future it promises for those we leave behind. In the concluding chapter of *How We Die*,⁴ Sherwin Newland writes that "rabbis often end a memorial service with the sentence, 'May his memory be for a blessing. . . .' Though it expresses what is obviously a universal wish, this simple thought deserves more frequent pondering by all of us." In celebrating the memory of Jared Goldstein's service as a doctor, this paper fulfills the rabbinical invocation. His memory is for a blessing. We are challenged to continue his life's work: to seek the wisdom to recognize our limits, to attend the dying with compassion and hope, and to make the relief of suffering our central concern. □

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Hospitalization for Hip Fractures Among North Carolina's Medicare Population

Anna P. Schenck, PhD and Suzanne Craig, MD, PhD

Hip fractures are the leading injury affecting Medicare beneficiaries. In 1995, hip fractures led to over 233,000 hospital stays for Americans age 65 and over.¹ Hip fractures are often fatal and even more often lead to reduced quality of life of those who survive.^{2,3} Most hip fractures in the elderly are attributed to falls, the risk of which increases dramatically with age.⁴ The rates of hip fracture are higher in women than in men, and higher among Caucasians than other races.⁴

In 1991, the United States Public Health Service issued a set of national health objectives, *Healthy People 2000*.⁵

Among its objectives were two specifically related to hip fractures: (1) to reduce the overall rate of hip fracture hospitalizations among persons age 65 and over to no more than 607/100,000; and (2) to reduce the rate among the group at highest risk (white women age 85 and older) to no more than 2,177/100,000.⁵ Given these national objectives, we undertook the present study to document hospitalization rates for hip fractures among North Carolina's Medicare population and thus to eluci-

date the burden of hip fractures in North Carolina. We compare North Carolina hip fracture hospitalization rates to the national objectives of *Healthy People 2000*.

Methods

We examined North Carolina Medicare hospital claims for persons age 65 and over from January, 1994 to December 31, 1997. Hospital stays were attributed to hip fractures if the

Table 1. Demographic and hospital stay characteristics of North Carolina Medicare beneficiaries hospitalized for hip fracture, 1994 – 1997

| | 1994 | 1995 | 1996 | 1997 |
|-----------------------------|-------|-------|-------|-------|
| Number of patients | 6704 | 6795 | 7383 | 7384 |
| Age: 65-74 | 18.4% | 19.2% | 19.0% | 17.4% |
| 75-84 | 45.3% | 43.9% | 44.6% | 43.7% |
| 85+ | 36.3% | 36.9% | 36.4% | 38.8% |
| White race | 90.1% | 90.8% | 90.5% | 90.8% |
| Women | 78.7% | 79.2% | 78.6% | 79.1% |
| Admitted via emergency room | 73.6% | 76.9% | 77.1% | 74.5% |
| Discharged to nursing home | 47.0% | 49.7% | 51.0% | 55.0% |
| Died while in hospital | 3.9% | 3.7% | 3.0% | 2.8% |

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Table 2. Hospitalizations for hip fracture per 100,000 Medicare beneficiaries, by age

| | Age 65-74 | Age 75-84 | Age 85+ |
|------|-----------|-----------|---------|
| 1994 | 248 | 1149 | 3089 |
| 1995 | 260 | 1113 | 3047 |
| 1996 | 278 | 1191 | 3167 |
| 1997 | 257 | 1127 | 3259 |

primary cause for the hospitalization was fracture of the neck of the femur (International Classification of Diseases, Ninth Revision, codes 820.0 - 820.9). Demographic and hospital stay characteristics for all cases were extracted from the Medicare claims database. North Carolina Medicare enrollment files were used to generate age-, race-, and sex-specific population-based denominators. Hospitalization rates were calculated separately by age, race, and sex groups. Records for which race was unavailable (<1%) were excluded from the rate calculations.

Results

Between 1994 and 1997 there were 28,266 hospitalizations for hip fracture among Medicare beneficiaries age 65 and over. The preponderance of hip fracture patients were age 75-84, the vast majority (more than 90%) were white, and nearly 80% were women (Table 1). Three quarters of the patients entered the hospital through the emergency room. The most common discharge destination for patients hospitalized with hip fracture was to a skilled nursing facility (in 51% of cases over all), but there was a distinct trend upward over time from 47% in 1994 to 55% in 1997. The average length of stay for hip fracture patients (not shown in the table) decreased each year, dropping from 10 days in 1994 to 7.5 days in 1997. The average hospital charge for hip fracture patients ranged between \$13,272 and \$14,029 during the four years.

Hip fracture hospitalizations were more prevalent among the oldest beneficiaries and increased dramatically with age

Table 3. Hospitalizations for hip fracture per 100,000 Medicare beneficiaries

| | Men | | Women | |
|------|-------|-----------|-------|-----------|
| | White | Non-white | White | Non-white |
| 1994 | 464 | 305 | 1158 | 439 |
| 1995 | 457 | 267 | 1177 | 422 |
| 1996 | 505 | 273 | 1243 | 484 |
| 1997 | 481 | 286 | 1234 | 477 |

(Figure and Table 2). There was no clear trend in rates of hospitalization by year (Table 2). The rate of hospitalization for hip fracture was 12 times higher for Medicare beneficiaries age 85 and older than for those age 65-74. Rates were lowest for non-white men and higher, but approximately equal, for white men and non-white women. They were much higher for white women (Table 3), who had fracture rates that were 2.5 to 4 times higher than the rates for other groups.

North Carolina hip fracture hospitalization rates for all Medicare beneficiaries for the four years under study (821/100,000) were 35% above the *Healthy People 2000* goals for those age 65 and older (607/100,000). The highest rate (851/100,000 in 1996) was 40% above the goal. The rates for white women in North Carolina age 85 and older were the worst of all, rising from 3880/100,00 in 1994 and 1995 to 3984 in 1996 and 4054 in 1997. These figures are perilously close to twice the *Healthy People 2000* target rate for white women age 85 and older (2177/100,000).

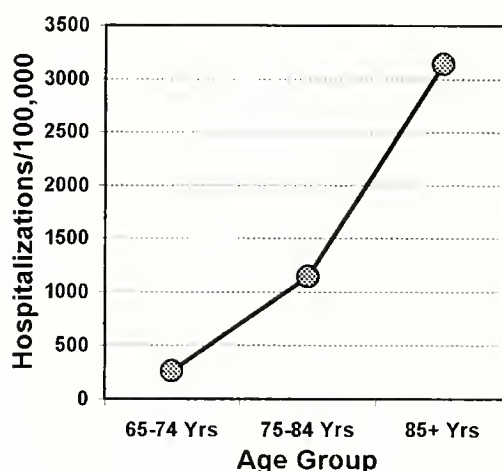


Figure. Age-related increase in rate of hospitalization for hip fracture among Medicare beneficiaries, 1994-97.

Discussion

We designed our methodological approach to insure comparability to the objectives of *Healthy People 2000*. However, two cautions are necessary in interpreting our data. First, we counted all hospitalizations, not the incidence of hip fractures. This means that people hospitalized twice for the same hip fracture were counted twice, thereby overestimating the true rate of hip fractures. In North Carolina, approximately 7% of hip fracture patients are hospitalized more than one time during the year. Secondly, hip fractures that were classified as spontaneous (International Classification of Diseases, 9th Revision, code 733.14) are not included here, resulting in a slight underestimate of hip fracture hospitalizations in North Carolina. Approximately 200 Medicare ben-

eficiaries are hospitalized each year for spontaneous hip fractures.

Even given the above cautions, our data show that hip fractures exact an enormous toll on the Medicare population in North Carolina. Our study is consistent with others in finding that older white women are at the highest risk of hospitalization for hip fracture. The exact causes of hip fractures in North Carolina are not clear because external codes for injuries are rarely used in Medicare hospital discharge data (available in only 13% of the records examined).

Comparison of the rates of hip fracture in North Carolina to the goal rates of *Healthy People 2000* reveals large gaps, both for the entire population over age 65 and, especially, for white women age 85 and older. Strategies for preventing hip fractures include reducing the prevalence of osteoporosis, increasing physical fitness among older adults, and modifying environments to make falls less likely and less damaging. The Osteoporosis Prevention Task Force of North Carolina, established in 1997, is hoping to develop education campaigns regarding osteoporosis and is working for the passage of mandatory insurance coverage of bone mass measurement (measurement of bone mass allows osteoporosis to be diagnosed and treated before fractures occur). Efforts are under way to promote physical activity through the North Carolina Heart and Stroke Task Force and the Governor's Council on Fitness. Increased use of external cause of injury codes would aid in our identification of environmental hazards that could be changed to reduce the risk of injuries and lessen their severity.

It is clear from our data that North Carolina will not meet the *Healthy People 2000* goals. National groups have already begun setting new health objectives for the year 2010.⁶ We must begin work now to insure North Carolina's ability to respond to and meet the new objectives. □

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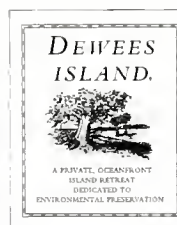
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'Do Not Resuscitate' Orders

The Right to Refuse Cardiopulmonary Resuscitation

Leonard Ferenz, PhD, and Joanna Dudley, MSW, CCSW

Let us give you a case in point. In the spring of 1998, the daughter of Ms. S, a patient enrolled with a public home care agency in North Carolina, asked for help in obtaining a "Do Not Resuscitate" (DNR) order. The mother's condition had declined to the point that both patient and family did not want heroic measures taken in the event that Ms. S became unresponsive. With the assistance of a medical social worker, a DNR order form was completed and notarized. Soon after, Ms. S required transportation to a doctor's appointment. A private, for profit, nonemergency ambulance service was called. When the ambulance staff was advised of the DNR order, they told the family they would not honor the order because it was invalid—in fact, "not worth the paper it is written on."

The family, confused and frustrated, called the medical social worker who had helped them. She, too, was bewildered by the response of the ambulance personnel and called their home office. She was told that the DNR order presented to them was invalid because it was not written on the official, gold-colored form approved by the North Carolina Medical Society (it was a photocopy) and had not been signed by an attending physician.

This case illustrates the confusion that surrounds DNR orders and other legal instruments used to decline cardiopulmonary resuscitation (CPR) in emergency medical situations. In the case of Ms. S, we can understand the reluctance of the ambulance staff to honor the DNR order presented by the family. The document did not conform to guidelines established by the North Carolina Medical Society for DNR directives. On the other hand, it is important to be sensitive to the wishes of patients and their families. If the documents provided truly reflect the patient's wishes, it would seem that

health providers should respect those wishes regardless of the form on which they are written or the manner in which they are presented.

In this article, we discuss the compelling moral argument for the position that mentally competent people have the right to express their refusal of CPR in any intelligible way they choose. This right pertains in any and all settings, including the home or roadside. A corollary of our position is that anyone offering medical services, including emergency and nonemergency ambulance personnel, firefighters, and others, has a legal and moral obligation to withhold CPR when instructed to do so by the patient, the patient's advance directives, or a family member's explicit verbal instructions.

The Scope of the Problem

Our position reflects a consideration of several questions concerning the status of so-called "out-of-facility" or "transportable" DNR orders. Doctors, nurses, and social workers are often asked by patients and family members how various medical service providers will respond when shown, at home or at the scene of an accident, DNR orders, photocopies of DNR orders, or other written devices refusing CPR. Two years ago, the ethics committee of a local home health facility met to discuss these questions. They were told by representatives of the county Emergency Medical Services (EMS) that health providers in our county recognized only original, notarized, and current DNR orders, completed and signed by an attending physician on the form authorized by the North Carolina Medical Society. EMS also told the committee that CPR would be performed regardless of any "nonofficial" patient documents to the contrary and over the objections of family members or other surrogate decision-makers present. Members of the committee were surprised and concerned. After lengthy discussion, the committee and the three EMS representatives became convinced that this policy was both legally and morally wrong.

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Subsequently, through the initiative of its Medical Director, EMS of Cabarrus County has changed its policy on DNR orders and advance medical directives. We believe that the change was indicated, but the new policy has actually added to the confusion we face when advising patients. The present difficulty stems from the inconsistent ways in which different providers respond to refusals of CPR. In Cabarrus County, the EMS procedure manual now instructs personnel "to obey the patient's wishes regarding resuscitation" and to honor the requests stated in a Living Will "or *any other device* [emphasis added] stating his or her wishes regarding resuscitation." EMS personnel are "to make the correct decision for [each] patient, regardless of the presence of the State DNR form." Thus, EMS personnel are asked to honor any document that expresses the patient's desire to forgo CPR or the instructions of family members who inform providers that the patient does not wish resuscitation.

Unfortunately, the County's private, nonemergency ambulance service does not follow the EMS procedures. As we noted above, Ms. S.'s non-EMS provider will withhold CPR only when presented with a "valid" DNR order written on the form distributed by the North Carolina Medical Society, and signed and dated by the attending physician. Inconsistent practices are creating significant confusion. We now find that some families are afraid to use nonemergency ambulance services or to make emergency calls for fear that their loved ones, especially the frail and the elderly, will be subjected uselessly to aggressive CPR. Health care providers, social workers, family members, and patients alike get frustrated trying to ensure the right of all of us to refuse unwanted medical treatments.

Avoidable Confusion about Terms

Much of the confusion about transportable and out-of-facility DNR orders turns on an important difference between DNR orders and advance medical directives. DNR orders are directives written by physicians based on the wishes of their patients or surrogate decision-makers or, in the absence of either, on the attending physician's medical judgment. The DNR order is a medical directive communicating a physician's instructions to other members of the medical community. In contrast, advance medical directives (commonly called "advance directives") are written by or spoken by individuals who are or may become patients. Advance directives instruct health care providers about treatments or procedures that one wishes not to receive under certain conditions. Advance directives need not and may not reflect the medical judgment of an attending physician. For example, patients might issue advance directives indicating that they do not wish CPR in the event they permanently enter a comatose or vegetative state. They can issue such directives without concurrence from a physician, but strictly speaking they are not "DNR orders"

even though they express the same intent. Advance directives reflect only the interests of the individual; unless they incorporate the considered (and signed) judgments of an attending physician, they are not DNR orders.

For several reasons, we believe it is crucially important to maintain the distinction between DNR orders and advance directives refusing CPR. DNR orders represent the formal judgments of a member of a professional community. This means that the physician shares with the patient responsibility for the decision not to resuscitate. It also means that the physician's decision to write a DNR order must adhere to accepted medical practices and standards of care. Physicians are accountable to both the medical community and society itself for DNR decisions. Advance directives, on the other hand, since they express only the interests and desires of individuals representing themselves, need not accord to medical criteria or reflect medical standards. They simply tell others, specifically health care providers, which treatments or procedures the individual does not want in the event he or she is unable to express these interests directly.

For the sake of clarity, therefore, we suggest that the term "medical directive" be used to refer only to documents written by medical professionals. We also suggest that the designation "DNR order" continue to be limited to an attending physician's declaration that CPR should be forgone for a specific, identified patient. The term "advance directives" (or, perhaps better, "patient directives") should continue to refer to an individual's statement of medical care preferences. For the sake of discussion, we will call a patient directive to forgo CPR a Refusal of Resuscitation declaration ("ROR declaration").

The moral and legal problem for patients and families is whether ROR declarations will—or should—be honored by health care professionals, EMS personnel, and others. At present, all medical service providers in North Carolina will honor a current, properly signed, and original (not a copy) DNR order. This is not the case with ROR declarations or photocopies of a valid DNR order. In our own county, some providers honor all devices that clearly and honestly state a person's desires about resuscitation; others do not. The real issue is not so much whether DNR orders are transportable or whether photocopies or expired orders should be honored, but whether patient-generated or initiated advance directives refusing CPR should be honored in all settings.

The Legality of a ROR Declaration

The legal argument for honoring a ROR declaration is grounded in case law. The right of individuals to refuse unwanted medical treatment has been recognized in several federal and state court decisions, beginning with the 1914 case of *Schloendorff v Society of New York Hospital*, and extending to the recent case of *Cruzan v Director, Missouri*

Department of Health, et al, in which the United States Supreme Court noted that, under the 14th amendment, persons have a constitutionally protected "liberty interest" to refuse medical treatment.

The right to accept or refuse medical and surgical treatments—and to issue directives regarding such treatments—is also recognized in both federal and state statutes. Section 4206 of the federal Omnibus Budget Reconciliation Act of 1990, popularly known as the Patient Self Determination Act¹, requires all health care providers and organizations eligible for Medicare or Medicaid reimbursement "to provide written information to each [adult individual receiving medical care] concerning . . . [the] individual's rights under State law (whether statutory or as recognized by the courts of the State) to make decisions concerning such medical care, including the right to accept or refuse medical or surgical treatment and the right to formulate advance directives."²

Reinforcing the right to accept or refuse treatments, most states have legally recognized the right to a "natural death." North Carolina's Natural Death Act notes explicitly "that a patient or his representative has the fundamental right to

"The moral and social problem confronting us is whether a refusal by EMS personnel and others to accept non-standardized advance directives . . . constitutes an unacceptable act of medical authoritarianism."

control the decisions relating to the rendering of his own medical care, including the decision to have extraordinary means withheld or withdrawn in instances of a terminal condition."³ Note that the language of this act does not say that persons possess this right *only* with regard to extraordinary means or *only* when they are suffering a terminal condition. One may refuse even life-saving treatments in circumstances that are not terminal or incurable (may refuse on religious grounds, for example, a potentially life-saving blood transfusion).

The North Carolina Natural Death Act also provides an "optional and nonexclusive" procedure for exercising the right to make decisions concerning one's medical care. The "nonexclusive" component is not described in the Act itself, but, according to Lance Stell, a medical ethicist with Carolinas Health System, "To take seriously the non-exclusive character of the living will statutes [including specifically North Carolina's Natural Death Act], the physician should place primary emphasis on determining the patient's intent rather than the form he or she may have chosen to express

it."⁴ As we understand the general language of this act, anyone rendering medical care must respect the intent of the patient regardless of the form in which this intent is expressed.

None of these statutes limits the obligation to respect the decisions of patients to physicians, nor do they limit the applicability of the right to refuse treatment to specific locations. There is no reason to believe that the right to refuse treatment applies only to physicians practicing in hospitals. Any and all individuals who render care are required by these acts to respect the wishes of individuals in any setting and when communicated in any credible and intelligible form.

The Morality of a ROR Declaration

The moral reasoning that supports honoring advance directives is grounded in the principle of autonomy, the moral principle that demands respect for individual self-determination and self-governance. Advance directives express an individual's self-determined preferences and desires. Thus, to the extent that we respect an individual's right of self-determination, to that extent we should respect advance directives, including a ROR declaration. Of course, in our society the principle of autonomy and rights of self-determination are not absolute. We limit personal freedoms and liberty to protect others from harm and sometimes to protect individuals from harming themselves. Laws such as those requiring use of seatbelts or protective helmets, for example, are designed to protect individuals from what society considers to be irrational or unwarranted risks. In such instances, preventing persons from taking these risks is more important than protecting their freedom to take risks. On the other hand, our society has not made hang-gliding, bungee-jumping, or boxing illegal even though these activities clearly involve substantial risk of personal injury. Where society chooses safety over freedom or freedom over safety is unpredictable at best.

The medical field has a long tradition of authoritarian intervention. Indeed, several studies show that end-of-life care continues to be influenced by more traditional practices to prolong life than by patient preferences.⁵ These studies point out the reluctance of physicians to discuss end-of-life care and the lack of communication between care-givers and patients about their preferences and desires. Providers generally feel that if they are to err, they should err on the side of life. Thus, if a patient's preferences are unclear, ill-informed, of questionable origin, or not autonomously expressed, providers should choose to preserve and prolong life. Concerns about possible litigation, furthermore, have led to a great deal of so-called "defensive medicine." Consequently, authoritarian medicine has yielded only reluctantly to practices that honor the patient's preferences and desires rather than just the patient's organic survival.

The moral and social problem confronting us is whether a refusal by EMS personnel and others to accept non-standardized advance directives—those not yet officially recognized by the North Carolina Medical Society—constitutes an unacceptable act of medical authoritarianism.

Implied Consent vs. Battery

There are risks in not following patients' wishes when possible. Any form of touching an individual without consent is a violation of bodily integrity. According to the moral principle of autonomy and the common law principle of self-determination, the violation of bodily integrity without consent constitutes battery. Thus, CPR performed in the face of a legitimate advance directive refusing it may provide a legal basis for charges of battery.

Some EMS providers believe, however, that the very act of requesting emergency medical services implies acceptance of standard emergency medical care, including CPR. The underlying assumption is that patients or their representatives, by virtue of calling for emergency help, have "changed their minds" about any existing directives. The call itself is thus regarded by some as giving implied consent to administer CPR.

We find this position untenable. First, we are aware of no empirical evidence to support the claim that patients or their representatives "change their minds" when they call for help. Clearly, patients and families are often calling for help in situations that are frightening and upsetting, but the help they seek relates to coping with the situation; there is no reason to assume that their call gives emergency medical providers *carte blanche*. Since the mid-70s, several court cases have prompted a general, albeit reluctant, acceptance of the refusal of life-saving treatments by members of religious groups such as Jehovah's Witnesses and Christian Scientists. It is a dubious assumption indeed that such people mean to abandon their religious beliefs when they call for emergency help. It seems to us equally doubtful that persons with advance directives—and strong feelings about the treatments they wish to forgo—mean to abandon those interests by calling.

Second, we cannot safely assume that anyone calling on behalf of someone else is authorized to give consent on behalf of that person. If the caller is a designated surrogate decision-maker for the patient, and no overriding advance directives have been issued by the patient, then the surrogate decision-maker does have the authority to give or withhold consent. However, relevant advance directives, if present, should override since they represent the wishes of the patient. We cannot assume that there is implied consent from the patient when someone else has called for help.

Finally, to our knowledge there exists no statutory or juridical basis for asserting that calling for emergency services constitutes an act of implied consent for any and all

forms of emergency medical care. If this is so, then there is neither an empirical nor statutory basis for assuming that people who seek emergency medical services are giving tacit approval for any and all forms of emergent care.

Concluding Thoughts

We believe that medical service providers should be aware that the guidelines established by the North Carolina Medical Society regarding DNR orders apply only to DNR orders. The care that has been taken to establish such guidelines is understandable considering that DNR orders are medical directives communicating instructions among medical professionals. However, these guidelines do not define or apply to all ways in which CPR may be refused, only those involving DNR orders.

There is merit in insisting that there be informed and validated refusals of treatments such as CPR. It is a mark of prudence to try to avoid litigation. However, we believe that it is a mistake to insist on a valid DNR order in an attempt to avoid litigation. People have both a legal and moral right to refuse CPR, and they are allowed under North Carolina law to decide about their own medical care in an optional and nonexclusive manner. At the very least, the refusal to accept advance directives offered in good faith constitutes an immoral, and probably illegal, obstruction of the exercise of these rights. In the worst case, patients or family members may bring battery charges against emergency medical service providers who perform CPR contrary to the indications of a valid advance directive. It seems to us that prudent North Carolina medical service providers should practice CPR in accordance with the directives presently used by EMS personnel in Cabarrus County. These instruct providers to honor any device reliably stating the patient's wishes regarding resuscitation.

If this county were less interested in protecting the autonomy of individuals who want to refuse unwanted medical treatments, then an authoritarian attitude might be defensible. However, our society has made it quite clear that autonomy and self-determination, even in matters of life and death, are—within limits—more important than the preservation of life. We believe this view is legally and morally justified. Providers of emergency medical services should therefore honor legitimate advance directives, including ROR declarations. Providers, of course, should exercise caution when there are legitimate concerns about the authenticity or intention of an advance directive or a family member's request for non-intervention. Clearly, if providers believe that foul play may be involved, or if there is confusion about the patient's actual wishes, then they should act in their best medical judgment. Otherwise, the competent and legally recognized decision-maker's wishes should prevail. □

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Commentary

A Delicate Partnership: Autonomy and Authority

C. Glenn Pickard, Jr., MD, Internal Medicine, UNC-Chapel Hill
Chair, NCMS Task Force on Out-of-Facility DNR

I applaud the accompanying article by Ferenz and Dudley, and congratulate them for its timeliness, thoroughness, and erudition. I think the authors have done an unusually fine job of identifying and discussing the issues, and I would not quibble with any of the points they make. I do, however, strongly disagree with their conclusions!

As Chair of the Task Force that created the original *Out of Facility DNR Form* and its revision, *The Transportable DNR Form* ("Yellow Form"), I want to assure Ferenz and Dudley that, in the deliberations that led to the Yellow Form, the task force considered each and every point they raise in their article. Certainly no one disagrees with one of their major points—all patients have the complete right to refuse any and all care as long as they are able to express this wish themselves. But when patients cannot speak for themselves problems arise, and with them arises the need for advance directives and DNR orders.

Ferenz and Dudley propose that all health care providers seek to interpret the wishes of patients no longer able to express themselves, no matter how those wishes are presented—as formal documents such as a living will or durable power of attorney; as informal documents such as letters or simple statements; or as the verbal statements of those who purport to represent the patient—and that they follow these wishes as though they were formal, written medical orders. This would basically eliminate the traditional role of the physician whose task it has been to evaluate the circumstances and the nature of patients' wishes, the validity of documents, the authenticity of a spokesperson, and, when appropriate, to translate that evaluation into a formal DNR order. Ferenz and Dudley correctly identify the gravity of this process and identify all

the reasons why physicians should be involved, but then they wander off course. I cannot support their proposal to eliminate the physician, to have every person or provider make an independent assessment, and to act on the basis of this assessment.

Apparently, in attempting to initiate their system in their home community, Ferenz and Dudley have already experienced one of the problems that will arise: a lack of consistency from one provider to another. This is not my main objection to their proposal, however. The original Yellow Form was limited in its applicability, but the new Yellow Form can be used wherever a DNR order is appropriate, whether in an institutional setting or not. The new Yellow Form has the support of all health care providers in North Carolina and is rapidly gaining acceptance in the wide range of environments where it might be used—homes, long-term care facilities, hospices, hospitals, etc.

I strongly suggest an alternative to their proposal: that all concerned persons invest their energies in seeing that the Yellow Form and its supporting documentation become universally accepted and used as the only way to write DNR orders. This is by far the best way to ensure that the wishes of the patient always be respected without question or delay, and to reinforce the basic issue of patient autonomy raised in the article. The educational programs and discussions with providers necessary for full implementation of the Yellow Form are well under way. They deserve the full support of all concerned persons. With hard work and good will, I believe North Carolina can develop a system that will ensure that patients' wishes are followed in all but the most unusual circumstances and the present confusion and misdirection eliminated.

Domestic Violence and South Asian Women

M. Susan George, MSIII and Lisa Rahangdale, MSIII

A Letter from the Authors: We are third-year medical students at UNC who have recently completed a community health project examining domestic violence among South Asians. Initially, our goal with this project was to evaluate whether domestic violence exists among South Asians in North Carolina. As the project evolved, we expanded our activities to include outreach to the South Asian community and local domestic violence shelters.

We have worked with the Wake and Orange-Durham domestic violence shelters to facilitate successful interventions for South Asian women leaving abusive marriages. We have provided them with cultural sensitivity training as well as resources for future reference such as brochures in five South Asian languages. For a South Asian women's group associated with the Hindu Temple, we conducted a workshop on definitions of domestic violence and what they could do to help a friend in trouble. We conducted another workshop for undergraduate students from Duke, UNC, and Wake Forest universities at the Triangle Youth South Asian Conference. We also spoke with a group of UNC and Duke medical students, including both South Asians and non-South Asians, in an attempt to share with our peers the information gained through this project.

As North Carolina's South Asian immigrant population grows, domestic violence is likely to be an emerging issue. Currently, the only domestic violence organizations with knowledge about South Asian issues are those we trained in our workshops. We are submitting this article to the *North Carolina Medical Journal* in order to make physicians aware of the particular issues associated with domestic violence among South Asian women.

As a new bride, Asha (her name has been changed) came with her husband to North Carolina from India. Though there were hints of trouble at the beginning, she never expected the violence that would consume the next 17 years of her marriage. In addition to physical abuse, her husband subjected her and her children to name-calling, humiliation, and the constant fear of further violence. Today, Asha is divorced and lives alone with her children. She is economically self-sufficient, but lacks legal immigration status. Her family still suffers from the consequences of having lived with an abusive husband and father. Although her situation is not ideal, Asha knows it is better than a life of fear.

South Asians and Domestic Violence

It is very difficult for women to seek help while in an abusive relationship. Women who are economically and emotionally dependent on their partners fear escalated violence when they

leave. Immigrant women also face institutional and cultural barriers to seeking help.

An estimated one out of five South Asian families experiences domestic violence, and the South Asian community in the US is slowly becoming aware of this problem among its members. Beginning in the early 1980s, South Asian women in major urban areas such as New York, Chicago, and Washington organized to provide counseling to immigrant women in abusive marriages.¹ As women have learned about the services offered by these groups, the importance of these services as a resource for battered immigrant women has grown. For example, in its first seven years of operation, *Apna Ghar* of Chicago served approximately 1000 South Asian women and children (from the history and purpose statement of *Apna Ghar*, provided by Robert Gallenbach, July 1997). These shelters are an excellent resource for culturally sensitive counseling of women in large cities. Because they work solely with South Asians, counselors are skilled at offering alternatives to violent relationships that do not clash with traditional value systems.

There is no such organization working with South Asians in North Carolina. Some 30,000 new cases of domestic vio-

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lence were reported in North Carolina between 1996 and 1997, but it is impossible to determine how many of the cases involved South Asian women (who are described only as "Asian" if their race is documented at all).² Because of the growing national awareness of domestic violence among South Asians, and anecdotal evidence from community members in North Carolina, we have explored with workers in local shelters as well as members of the South Asian community how South Asian women experience domestic violence. In this article, we will highlight certain aspects of South Asian socialization and discuss the unique barriers South Asian women face.

Socialization of South Asian Women

We use the term "South Asian" to identify natives of India, Pakistan, Nepal, Sri Lanka, and Bhutan—peoples of diverse religions (including Hindu, Muslim, Christian, Sikh, Jain, Buddhist) and cultures. Despite their diversity, these people share certain traditional tenets about the role of women in society, tenets that influence how South Asian women in this country and back home view the world. (These generalizations do not, of course, apply invariably to all South Asian women).

South Asian women are socialized according to their place in the family. People often live in multigenerational homes where the eldest in the family is most respected. Respect for authority maintains order within a family. A new bride has the least authority over family decisions, but her status in the family increases as she bears children. Regardless of a woman's education or profession, motherhood defines her role in the family and confers respect.

Within a family unit, men's and women's roles are complementary. Each role is equally important but separate. Men and women are considered to have different strengths and are expected to focus on tasks they do well. For instance, since women "instinctively" care for children, it is natural for the mother to raise them. There is little overlap of domestic duties, but a wife's duties are as important as a husband's job.

Personal humility is emphasized by South Asians, who are taught that a life of patience, tolerance, and humility is better than one that draws attention to oneself. For example, Indians revere Gandhi for obtaining India's independence through passive resistance. This reverence for modesty may explain why South Asians often communicate indirectly, through implication. Because husbands and fathers assume responsibility for their wives and children, speaking up is considered unnecessary and even inappropriate. Women often assume that they will be cared for by the authority figure in the household.³

A woman who maintains her traditional family role is viewed with respect as a mother, daughter, or sister. This ideal woman places family needs above her own, respects her

elders, and fulfills her obligations as mother and daughter. Married women may view a single or divorced woman with suspicion and fear. Since their identity is not tied to a family, single women may disregard the usual rules and disrupt families. This characterization relates to another cultural image of women as "wild" and perhaps dangerous—unless they are "attached" to a man through marriage and their power thereby controlled.⁴ Therefore, although motherhood gives a woman authority in the household, society accepts her power only through her relationship with her husband.

Barriers to Assistance

Stable patterns of socialization can build healthy families by creating stable relationships in which young and old family members are cared for. An abused wife, however, must struggle between protecting herself or protecting her family. Divorce is not always an acceptable solution. South Asians believe strongly that children need a father and will not develop properly without one. A woman may want to avoid bringing shame on her family through scandal or divorce. If she leaves her husband, her family will get the reputation of raising unruly girls and this may decrease younger sisters' chances of marriage. Because the family is a unit, the actions

"They may lack basic communication skills because they cannot speak English fluently. They may not know how to drive, use public transportation or start a bank account. Under such circumstances, starting a new life requires a great deal of courage."

of one member can have profound effects on the remainder of the family.

And there is social pressure. The South Asian community often will not support women who decide to leave violent relationships. Admitting that there are family problems such as abuse is considered an affront to the values and culture of the immigrant's native land. Instead of blaming the abuser, the woman may be made to feel that some "inappropriate behavior" of hers initiated the abuse. The lack of community support is not overt but consists of a subtle withdrawal of contact.¹

Abusers may rationalize their behavior by maintaining that dominance protects women from cultural contamination by Western feminist values. Women may feel guilty if they socialize with Americans, wear Western clothes, or stand up for themselves. As a result, some South Asian women have no knowledge of the outside world. They may lack basic communication skills because they can not speak English fluently. They may not know how to drive, use public transportation or start a bank account. Under such circumstances, starting a new life requires a great deal of courage.

Legal impediments to getting help often involve immigration issues. If their husbands have sponsored their immigration into the US, abused women may fear becoming illegal aliens unless they have their husbands' continued support. In 1986, the *Marriage Fraud Act* established the requirement for a two-year conditional residency for immigrant women married to US citizens or to legal permanent residents. After two years, these women could get a green card after a joint petition by husband and wife asserting that the marriage was made in good faith. Abusive husbands, by withholding their input, could effectively deny their wives legal immigration status indefinitely. The 1994 *Violence Against Women Act* now allows women to petition for a green card without their husbands' approval.³ Unfortunately, South Asian women may not know about this law, or their case may fall into one of the law's loopholes.

Conclusions

The effect of domestic violence on South Asian women is unique because of cultural and institutional barriers to leaving abusive relationships. Care providers must understand each woman's background when considering how to advise their patients. If the woman's background is not considered, both patient and counselor may be left unsatisfied—perhaps creating a barrier to future inquiries for assistance.

It is important to remember that physicians may be an abused woman's only contact outside the home. Domestic abuse may not only affect interactions with abused women but may also play a role in communicating with South Asian women in general. For example, South Asian women often will not explicitly state their concerns. They may divulge a complete personal history only on direct inquiry. Because of their respect for authority, they may not question a physician's decisions about their care. Women may take their children for regular checkups but ignore their own health concerns. Husbands may accompany their wives on routine visits and play an active role in their personal medical decisions.

Although domestic violence may be difficult to define for South Asians, physicians should not hesitate to ask them the standard questions such as, "Do you feel safe in your home?" An abused woman may not respond initially, but the seed will be sown for future beneficial intervention. □

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Infant Mortality and Low Birthweight in North Carolina

The Last 10 Years

Kathryn Surles, MEd, Paul Buescher, PhD, and Robert Meyer, PhD

In 1988, Georgia was the only state with an infant death rate higher than North Carolina's. This situation provided the impetus for new maternal and child care initiatives, including the expansion of Medicaid coverage for pregnant women. In the present report we use two-year infant death rates to examine the relationship between birthweight and cause-specific infant mortality over the past decade. We also examine changes in the percentages of live births in low birthweight categories, using as a baseline the years 1987-88, a period of high infant mortality.

Methods

The linking of birth and infant death certificates is a useful method widely used to examine risk factors associated with poor birth outcomes.¹ These risk factors, derived from information collected on the birth certificate, include sociodemographic, behavioral, and medical factors related to fertility and pregnancy outcome. Birthweight is an important determinant of infant mortality and is analyzed in this paper.

The numerator we used to calculate mortality risks was the number of deaths among infants *born during the period of study*. This means these risks will differ slightly from the mortality rates published in standard North Carolina vital statistics reports. Also, death data for the 1996 birth cohort are provisional, so final mortality risks may differ slightly for this birth cohort.

Because of the wide disparity in infant mortality risks by race, we analyzed white and non-white (minority) infant mortality separately. In examining the age-specific compo-

nents of infant mortality, we defined neonatal deaths as those occurring during the first 28 days of life, and postneonatal deaths as those occurring between 28 days and one year of age.

We used a method for partitioning differences in mortality rates to determine the percentage decline in overall infant mortality that was attributable to improved survival in specific birthweight categories.² We multiplied the proportion of births in a given weight group in 1995-96 by the mortality risk for that group and subtracted the product from the corresponding product for 1987-88. We then divided the difference by the total decline in infant mortality between 1987-88 and 1995-96 for all weight groups combined. This calculation takes into account changes in both birthweight distribution and birthweight-specific survival on changes in overall infant mortality. The percentage decline in overall infant mortality attributable to a particular cause of death was obtained by dividing the absolute change in mortality risk for that cause by the absolute change in overall mortality risk.

Results

As shown in Figures 1 and 2, rates of low birthweight and infant death for both whites and minorities in North Carolina have consistently exceeded the nation's. Moreover, for both whites and minorities, the state's rate of low birthweight has risen, but, despite this increase, infant mortality for both whites and minorities in North Carolina has declined over the past decade.

Trends in Low Birthweight. The percentage of babies in each of the low (<2,500 grams) birthweight categories has risen steadily and consistently for both whites and minorities. Overall, the percentage with low birthweights increased from 8.0% in 1987-88 to 8.7% in 1995-96 (Table 1), and there were

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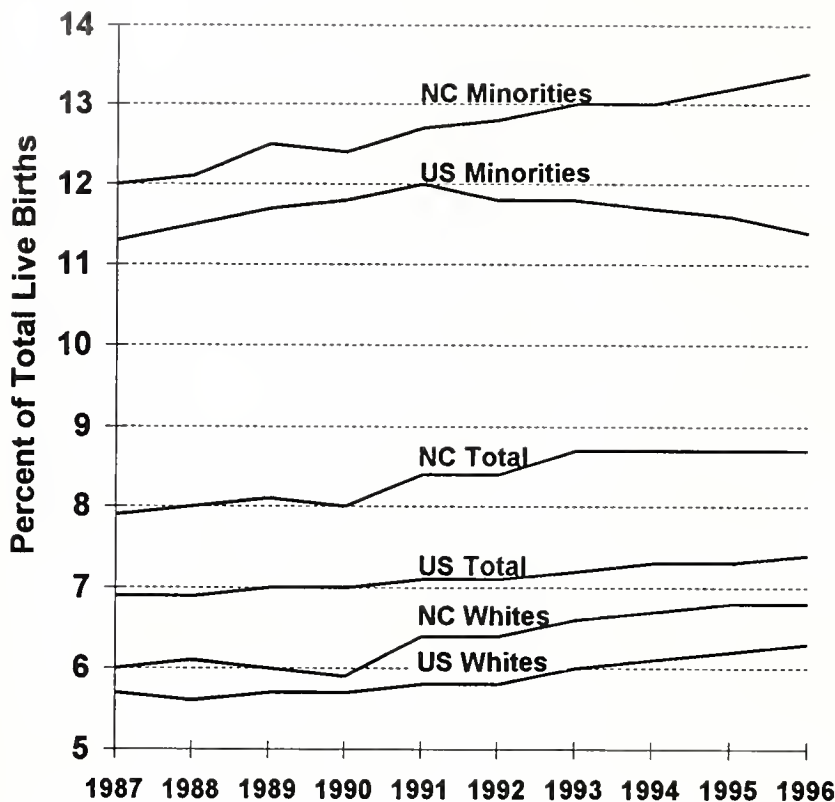


Figure 1. (above) Percentage of White and Minority Live Births <2,500 Grams in North Carolina and the United States.

increases in all low birthweight categories. In 1995-96, the percentage of low birthweight babies remained about twice as high for minorities (13.3%) as for whites (6.8%). The racial difference is even more pronounced at the lowest end of the birthweight distribution.

Changes in Birthweight-Specific Infant Mortality. Between 1987-88 and 1995-96, the state's infant mortality risk declined by 27%, from 12.3 to 9.0 deaths per 1,000 live births. The infant mortality risk declined 26% for whites and 26% for minorities (from rates of 9.3 and 18.8 to rates of 6.9 and 14.0 deaths per 1,000 live births, respectively), but there was a persistent two-fold disparity between minorities and whites. Table 1 shows birthweight-specific mortality risks for infants born in 1987-88 and 1995-96. The rightmost column of the table gives the percentage of the total decline in infant mortality attributable to improved survival among infants in each birthweight cat-

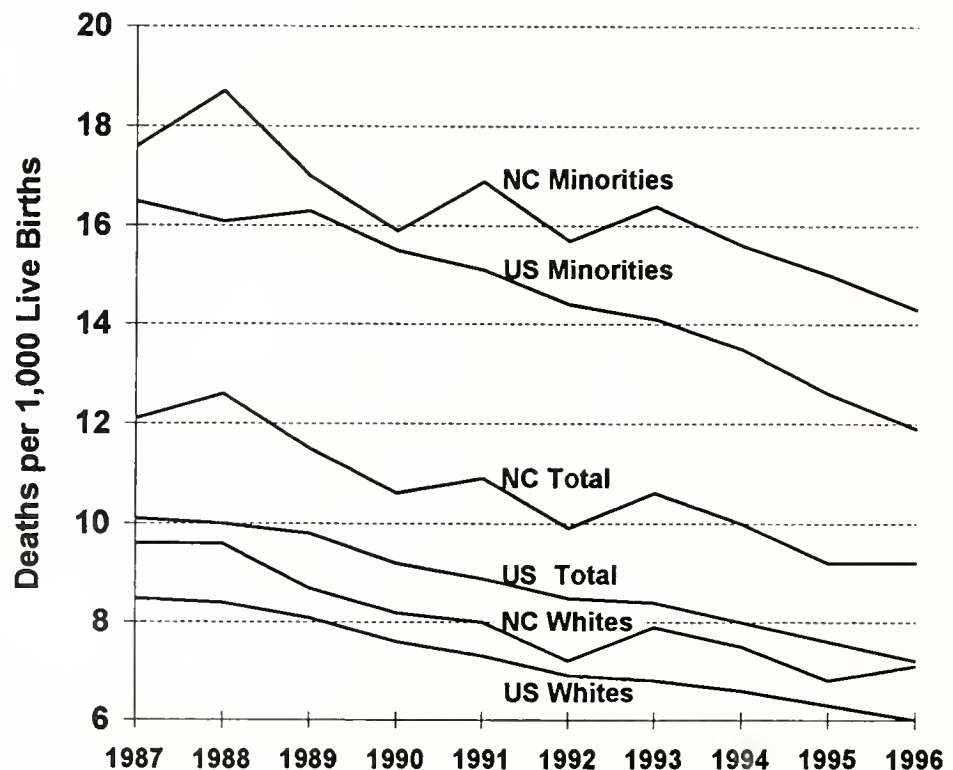


Figure 2. (right) White and Minority Infant Death Rates in North Carolina and the United States. (US data from annual Monthly Vital Statistics Reports, National Center for Health Statistics).

egory. For both whites and minorities, the death rate for infants weighing under 500 grams declined slightly, but that improvement was negated by an increase in the numbers of births in that high-risk category where the chances of survival remain low. For all other birthweight categories, declines in mortality risk contributed to the overall improvement in infant mortality.

Because it includes the great preponderance of births, the normal birthweight category (>2,499 grams) accounted for most of the decline in infant mortality (54% of the decline in whites and 49% in minorities). Mortality risk among those normal-weight newborns actually declined by 33% for whites and 38% for minorities. Also of interest is the apparent survival advantage of minorities at low birthweights. Although a greater percentage of minority births fall in birthweight categories less than 2500 grams, the 1995-96 mortality risk of babies in those categories was lower for minorities than for whites (see Table 1 and Figure 3).

Changes in Neonatal and Postneonatal Mortality. Table 2 shows the numbers and rates of neonatal and postneonatal deaths among infants born in 1987-88 and 1995-96. Both whites and minorities experienced similar declines in both components of infant mortality, with greater reductions in postneonatal than in neonatal mortality risk.

Changes in Cause-Specific Infant Mortality. Table 3 shows cause-specific infant mortality rates for 1987-88 and 1995-96. Among whites, reductions in four categories—respiratory distress, SIDS, birth defects, and other respiratory conditions—accounted for 73% of the overall decline. Among minority infants, reduced mortality from those causes and “other perinatal conditions” accounted for 93% of the overall decline in infant mortality. The substantial reductions in both white and minority infant deaths from respiratory distress syndrome and other respiratory conditions are commonly attributed to the now widespread use of surfactant.

Table 1. Birthweight Distribution and Infant Mortality in 1987-88 and 1995-96 North Carolina Birth Cohorts

| | 1987-88 | | | 1995-96 | | | |
|--------------|------------------------|---------------|-----------------|------------------------|---------------|-----------------|---------------------------------|
| Weight Group | Live Births (% Total)* | Infant Deaths | Mortality Risk† | Live Births (% Total)* | Infant Deaths | Mortality Risk† | % Contribution to Total Decline |
| All Races | | | | | | | |
| <500 grams | 367 (0.19) | 355 | 967.3 | 475 (0.23) | 440 | 926.3 | -8.9 |
| 500-749 | 608 (0.32) | 443 | 728.6 | 701 (0.34) | 354 | 505.0 | 19.5 |
| 750-999 | 618 (0.32) | 191 | 309.1 | 788 (0.38) | 134 | 170.1 | 11.3 |
| 1000-1499 | 1,452 (0.76) | 178 | 122.6 | 1,792 (0.87) | 115 | 64.2 | 12.1 |
| 1500-2499 | 12,149 (6.37) | 325 | 26.8 | 14,213 (6.90) | 247 | 17.4 | 16.3 |
| 2500+ | 175,619 (92.04) | 797 | 4.5 | 187,942 (91.27) | 543 | 2.9 | 49.8 |
| Total | 191,041 (100) | 2342 | 12.3 | 205,983 (100) | 1851 | 9.0 | |
| Whites | | | | | | | |
| <500 grams | 133 (0.10) | 129 | 969.9 | 192 (0.13) | 176 | 916.7 | -9.9 |
| 500-749 | 264 (0.20) | 196 | 742.4 | 317 (0.22) | 175 | 552.1 | 12.8 |
| 750-999 | 298 (0.23) | 103 | 345.6 | 350 (0.24) | 75 | 214.3 | 11.8 |
| 1000-1499 | 692 (0.53) | 99 | 143.1 | 952 (0.66) | 64 | 67.2 | 13.8 |
| 1500-2499 | 6,531 (5.00) | 190 | 29.1 | 8,075 (5.57) | 153 | 18.9 | 17.4 |
| 2500+ | 122,793 (93.94) | 473 | 3.9 | 135,143 (93.18) | 345 | 2.6 | 54.1 |
| Total | 130,733 (100) | 1210 | 9.3 | 145,075 (100) | 1001 | 6.9 | |
| Minorities | | | | | | | |
| <500 grams | 234 (0.39) | 226 | 965.8 | 283 (0.46) | 264 | 932.9 | -13.1 |
| 500-749 | 344 (0.57) | 247 | 718.0 | 384 (0.63) | 179 | 466.1 | 26.5 |
| 750-999 | 320 (0.53) | 88 | 275.0 | 438 (0.72) | 59 | 134.7 | 11.2 |
| 1000-1499 | 760 (1.26) | 79 | 103.9 | 840 (1.38) | 51 | 60.7 | 10.8 |
| 1500-2499 | 5,618 (9.35) | 135 | 24.0 | 6,138 (10.08) | 94 | 15.3 | 15.9 |
| 2500+ | 52,826 (87.89) | 324 | 6.1 | 52,799 (86.72) | 198 | 3.8 | 48.5 |
| Total | 60,308 (100) | 1132 | 18.8 | 60,908 (100) | 850 | 14.0 | |

†Infant deaths per 1,000 live births.

*Percentages calculated exclude infants without recorded birthweights.

Table 2. Neonatal and Postneonatal Mortality in 1987-88 and 1995-96 North Carolina Birth Cohorts

| | Number of Deaths | | Mortality Risk* | | % Change |
|---------------------|------------------|---------|-----------------|---------|----------|
| | 1987-88 | 1995-96 | 1987-88 | 1995-96 | |
| All Races | | | | | |
| Neonatal† | 1,558 | 1,285 | 8.2 | 6.2 | - 24.4 |
| Postneonatal† | 784 | 566 | 4.1 | 2.8 | - 31.7 |
| Total Infant Deaths | 2,342 | 1,851 | 12.3 | 9.0 | - 26.8 |
| Whites | | | | | |
| Neonatal | 792 | 687 | 6.1 | 4.7 | - 23.0 |
| Postneonatal | 418 | 314 | 3.2 | 2.2 | - 31.3 |
| Total Infant Deaths | 1,210 | 1,001 | 9.3 | 6.9 | - 25.8 |
| Minorities | | | | | |
| Neonatal | 766 | 598 | 12.7 | 9.8 | - 22.8 |
| Postneonatal | 366 | 252 | 6.1 | 4.2 | - 31.1 |
| Total Infant Deaths | 1,132 | 850 | 18.8 | 14.0 | - 25.5 |

*Deaths per 1,000 live births.

†Neonatal: deaths of infants less than 28 days of age.

Postneonatal: deaths of infants 28 days to one year of age.

The death rate for prematurity/low birthweight increased by 18% for whites and 12% for minorities. Live births in which the infant weighed <500 grams increased from 0.19% in 1987-88 to 0.23% in 1995-96 (an increase of 21%); about 93% of these babies die (Table 1). Between 1987-88 and 1995-96, infant deaths accounted for by babies born weighing <500 grams increased from 15% to 24% of the total. A recent study of perinatal mortality in Alabama noted a large increase in live-born infants weighing <500 grams at birth, and attributed this to changes in reporting.³

Discussion

Infant mortality in North Carolina declined by 27% between 1987-88 and 1995-96. There were large reductions in the mortality risk for all birthweight categories except the very lowest, and improved survival of low birthweight infants was an important component of the overall decline in infant

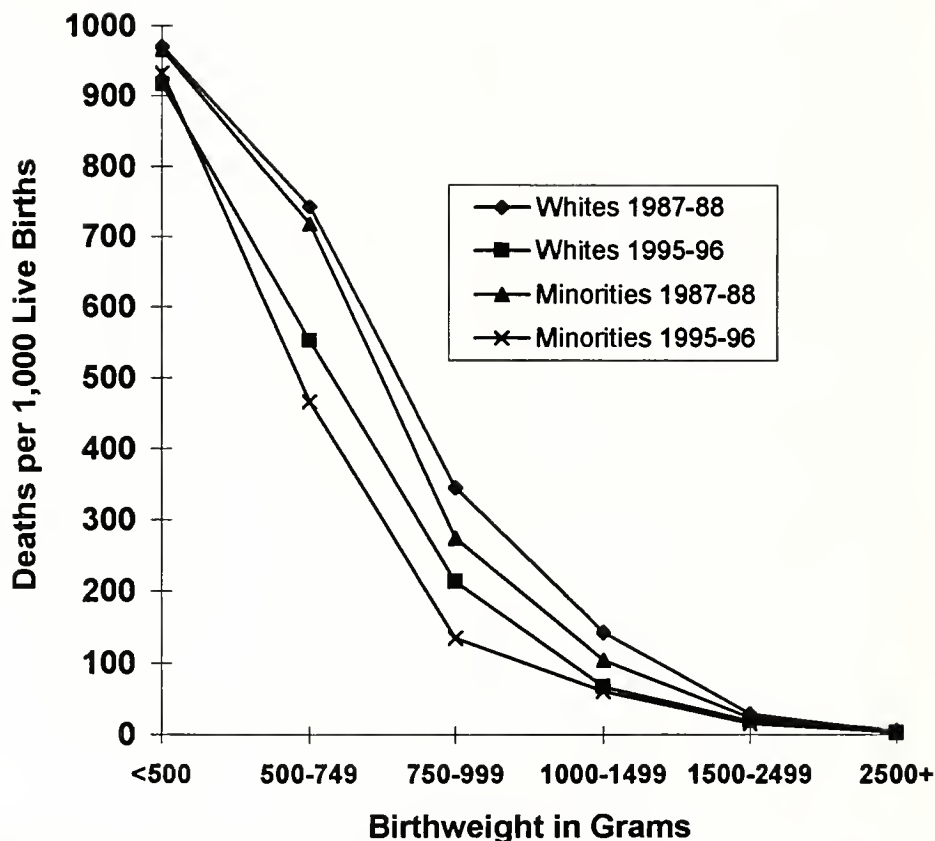


Figure 3. Birthweight-Specific Infant Mortality Rates for Whites and Minorities in 1987-88 and 1995-96 North Carolina Birth Cohorts.

mortality. Nevertheless, because of the large numbers of normal birthweight infants, about half of the reduction in overall mortality was due to improved survival of such babies.

Table 3. Cause-Specific Infant Mortality in 1987-88 and 1995-96 North Carolina Birth Cohorts

| | Number of Deaths | | Mortality Risk* | | % Change | % Contribution to Total Decline |
|------------------------------|------------------|--------------|-----------------|-------------|--------------|---------------------------------|
| | 1987-88 | 1995-96 | 1987-88 | 1995-96 | | |
| All Races | | | | | | |
| Birth Defects | 409 | 343 | 2.1 | 1.7 | -22.2 | 14.5 |
| Prematurity/Low Birthweight | 297 | 358 | 1.6 | 1.7 | +11.8 | - 5.6 |
| Respiratory Distress/BPD** | 221 | 102 | 1.2 | 0.5 | -57.2 | 20.2 |
| Sudden Infant Death Syndrome | 301 | 195 | 1.6 | 0.9 | -39.9 | 19.2 |
| Labor/Delivery Complications | 62 | 44 | 0.3 | 0.2 | -34.2 | 3.4 |
| Injuries | 82 | 65 | 0.4 | 0.3 | -26.5 | 3.5 |
| Infection | 168 | 132 | 0.9 | 0.6 | -27.1 | 7.3 |
| Maternal Complications | 194 | 193 | 1.0 | 0.9 | -7.7 | 2.4 |
| Other Respiratory Conditions | 204 | 109 | 1.1 | 0.5 | -50.4 | 16.5 |
| Other Perinatal Conditions | 203 | 121 | 1.1 | 0.6 | -44.7 | 14.5 |
| Other Known Cause | 181 | 147 | 0.9 | 0.7 | -24.7 | 7.1 |
| Unknown | 20 | 42 | 0.1 | 0.2 | +94.8 | - 3.0 |
| All Causes | 2,342 | 1,851 | 12.3 | 9.0 | -26.8 | 100.0 |
| Whites | | | | | | |
| Birth Defects | 271 | 240 | 2.1 | 1.7 | -20.1 | 17.8 |
| Prematurity/Low Birthweight | 121 | 158 | 0.9 | 1.1 | +17.8 | - 7.0 |
| Respiratory Distress/BPD** | 115 | 48 | 0.9 | 0.3 | -62.4 | 23.3 |
| Sudden Infant Death Syndrome | 155 | 110 | 1.2 | 0.8 | -36.0 | 18.2 |
| Labor/Delivery Complications | 33 | 21 | 0.3 | 0.1 | -42.6 | 4.6 |
| Injuries | 43 | 39 | 0.3 | 0.3 | -18.2 | 2.5 |
| Infection | 83 | 68 | 0.6 | 0.5 | -26.1 | 7.1 |
| Maternal Complications | 103 | 91 | 0.8 | 0.6 | -20.3 | 6.8 |
| Other Respiratory Conditions | 92 | 56 | 0.7 | 0.4 | -45.1 | 13.5 |
| Other Perinatal Conditions | 80 | 58 | 0.6 | 0.4 | -34.6 | 9.0 |
| Other Known Cause | 107 | 88 | 0.8 | 0.6 | -25.8 | 9.0 |
| Unknown | 7 | 24 | 0.1 | 0.2 | +209.2 | - 4.8 |
| All Causes | 1,210 | 1,001 | 9.3 | 6.9 | -25.8 | 100.0 |
| Minorities | | | | | | |
| Birth Defects | 138 | 103 | 2.3 | 1.7 | -26.2 | 12.4 |
| Prematurity/Low Birthweight | 176 | 200 | 2.9 | 3.3 | +12.3 | - 7.4 |
| Respiratory Distress/BPD** | 106 | 54 | 1.8 | 0.9 | -49.6 | 18.0 |
| Sudden Infant Death Syndrome | 146 | 85 | 2.4 | 1.4 | -42.4 | 21.2 |
| Labor/Delivery Complications | 29 | 23 | 0.5 | 0.4 | -21.6 | 2.1 |
| Injuries | 39 | 26 | 0.6 | 0.4 | -34.1 | 4.6 |
| Infection | 85 | 64 | 1.4 | 1.1 | -25.6 | 7.4 |
| Maternal Complications | 91 | 102 | 1.5 | 1.7 | +10.8 | - 3.4 |
| Other Respiratory Conditions | 112 | 53 | 1.9 | 0.9 | -53.2 | 20.4 |
| Other Perinatal Conditions | 123 | 63 | 2.0 | 1.0 | -49.4 | 20.8 |
| Other Known Cause | 74 | 59 | 1.2 | 1.0 | -21.2 | 5.4 |
| Unknown | 13 | 18 | 0.2 | 0.3 | +36.9 | - 1.6 |
| All Causes | 1,132 | 850 | 18.8 | 14.0 | -25.5 | 100.0 |

*Infant deaths per 1,000 live births.

**Bronchopulmonary dysplasia.

Percent changes may not be calculated directly from table because of rounding.

It is important to note that although birthweight-specific mortality decreased in this state over the period surveyed, there was an increase in the percentage of low-birthweight babies. Clearly these opposing trends have substantial consequences. Low-birthweight babies are 25 times more likely than those of normal birthweight to die in infancy. Until we lessen the risk that babies will be born at low birthweight, further reductions in infant mortality will be difficult.

We do not fully understand the reasons why there has been no improvement in the rates of low birthweight. An increasing frequency of multiple births (in which 60% of infants weigh <2,500 grams) contributes to this, as shown by a recent study in Canada.⁴ In North Carolina, 2.3% of live births in 1987 were multiple (twins, triplets, etc) and 2.7% in 1996, and the percentage of all low-birthweight (<2,500 grams) babies that were the product of multiple births increased from 16.3% to 18.2%.

The increasing percentage of infants delivered at extremely low birthweights could be a result of aggressive strategies for management of extremely premature labor. The use of cesarean section to "rescue" small fetuses of borderline viability might mean the live birth of some infants that in the past would have been stillborn. Because a high percentage of these infants subsequently die, aggressive obstetrical intervention will tend to increase the infant mortality rate. There is some evidence to support this idea. In North Carolina between 1988-89 and 1996-97, the cesarean delivery of infants weighing <500 grams increased from 3.9% to 11.8% of all live births; and of infants weighing 500-749 grams, from 24.0% to 41.8%, despite the fact that during this time the percentage of all live babies delivered by cesarean section decreased from 24 to 21%.

Low birthweight is a multi-faceted problem. More than medical interventions are needed to improve it. In 1996 alone, North Carolina women bore 9,128 low birthweight babies. In 78% of those cases, the mother began prenatal care in the first trimester. In 1988, 75% of all mothers began prenatal care in the first trimester, and this increased to 83% in 1996; despite this the percentage of low-weight births increased. Better prenatal care is very important, but it is not the only answer to reducing low birthweight. Since in 1996 81% of the 9,128 low birthweight were born to mothers age 20 and older, teenage pregnancy plays a relatively small role in low birthweight in North Carolina.

Health interventions are only part of the solution to the serious and difficult problem of low birthweight and infant mortality. A recent North Carolina study⁵ showed that maternal smoking and minority race were strong, independent predictors of low birthweight. Policies and programs designed to address the social and economic environment of families may help to reduce low birthweight, but we need more research to determine how environmental factors interact with biological characteristics to influence the risk of low birthweight.

In 1988, North Carolina ranked next to last in the nation in infant mortality. After that, North Carolina's rank improved to forty-third, but in 1995, 1996, and 1997, North Carolina's infant mortality rate remained unchanged, while the nation's rate continued to decline. As a result, national data for 1996 indicate that only three states had a higher infant mortality than North Carolina. Our high rate of low birthweight is not the only factor that accounts for our poor standing in infant mortality. Rates of death from birth defects and SIDS—two major contributors to infant death—are high in North Carolina as well.^{6,7}

Between 1987-88 and 1995-96, North Carolina significantly reduced infant mortality from respiratory conditions, birth defects, and SIDS. We had much less success in preventing preterm delivery, a major cause of low birthweight. We must build on and expand the arena of our successes if we are to continue the downward trend in infant mortality. □

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Don't overlook the special communiqué from the Editor on p. 141. For the *Journal*, it may be a matter of life and death.

Could We Keep the Rabies Epidemic Away from the Outer Banks?

Oral Rabies Vaccination of Raccoons

Maria Correa-Prisant, PhD, Lee Hunter, DVM, MPH,
and Stephanie Kordick, DVM

Rabies is epidemic in wild (and some domestic) animals in North Carolina. The high prevalence of this lethal viral disease has important—and expensive—health implications for North Carolinians. The animal epidemic here represents the convergence of three separate epidemics arising in different parts of the United States. Two, the Southern and mid-Atlantic epidemics, entered the state in the early 1990s and combined in the Piedmont region of North Carolina by 1996. In both, the primary vector of disease was the raccoon. The disease has crossed species, however; by July 31, 1998, there were 2,696 confirmed cases of terrestrial rabies in 2,148 raccoons, 192 foxes, 196 skunks, 91 cats, 33 dogs, 15 bobcats, 7 cows, 5 horses, 4 beavers, 2 groundhogs, 2 rabbits, and 1 deer. The third, mid-Western epidemic, carried primarily by skunks, crossed into northwest North Carolina from Tennessee. This one does not represent a major health threat; all current cases of rabies in the state are due to the raccoon variant.

The primary costs of rabies are for post-exposure prophylaxis (PEP) of humans, laboratory testing of animals, and animal control. There are no reliable data on the number of vaccinations actually carried out nationally or statewide, but the Centers for Disease Control estimates that 40,000 people need PEP every year in the US, at a cost per person between \$800 and \$2,200, depending on the need for and costs of rabies immune-globulin, 5 doses of human diploid cell vaccine, visits to doctor's offices and possible emergency room fees.^{1,2,3} Based on data from a single county with relatively

complete records, we estimate that 2,000 people received PEP in North Carolina last year at a cost of \$1.6-\$4.4 million. Since 1991, the state laboratory has processed 25,597 specimens for rabies identification at a cost of over \$3 million (estimated using data from other states).⁴ In Cumberland County, North Carolina, the cost of rabies prevention increased 270% from pre-epidemic stage in 1990 to epidemic stage in 1995.²

Oral Rabies Vaccination

Oral rabies vaccination (ORV) uses a genetically engineered, live vaccinia-virus vaccine to immunize wild animals, particularly raccoons, foxes, and coyotes. It has been used on a research basis in New York, Massachusetts, Ohio, Texas, New Hampshire, New Jersey, Vermont, and Florida.^{5,6,7} Studies in these states show promise for reducing wildlife rabies and creating a protective barrier between wild animals and domestic animals and humans.⁸

Administering ORV is a very involved and complex public health operation, which requires the collaboration and involvement of a number of health organizations, state agencies, and the public. Along the North Carolina Outer Banks, Bodie, Hatteras, and Ocracoke Islands are well-suited for ORV because they are virtually free of rabies even though the epidemic has spread through the state. However, recent confirmation of animal rabies in Kitty Hawk and Kill Devil Hills indicates that the epidemic is slowly entering the Outer Banks as well.

Even when sites are appropriate, other important elements must be considered. These include the potential for humans to be infected by the vaccinia virus (a remote possibility) and the need for long-term commitment from all par-

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ticipants to a program that may last 10-20 years.⁸ Stopping the program prematurely would allow the immunized animal population to decrease and the unimmunized to increase, increasing the likelihood of contact between rabid and susceptible animals.

We present here our estimates of what it might cost to institute an ORV program on the Outer Banks; discuss the different aspects of the program, including the use of a genetically engineered, live-vaccinia virus vaccine; and consider possible sources of funding.

Logistics of an ORV Program

The Outer Banks are a good choice for an ORV program. There are only three potential entry points for rabies: a thin stretch of land extending from Currituck County (on which sit the towns of Kitty Hawk and Kill Devil Hills), a bridge from Roanoke Island, and ferry connections to Ocracoke and southern Hatteras Island. The vaccination area would consist of the main islands of the Outer Banks (approximately 80 square miles), the three major entry points, and surrounding areas of buffer zones (40 square miles). For the first two years of the program, vaccine baits would be distributed over the whole area (120 square miles), later in the buffer zones only.

We calculated the costs of the program for a 20-year period using a 3% discount rate and two vaccine distributions per year.⁹ We assumed that costs remain fixed, and have made our estimates using data from other ORV programs (Ohio and Massachusetts) plus state data.¹⁰ Our models take into account the costs of the vaccine and its delivery, surveillance, public health education, diagnostic testing, and salaries for state employees. Based on recommended density of 150 baits per square mile, at \$1.50 per bait, we estimated vaccine bait distribution costs at \$100 per square mile (using state employees, volunteers, and state resources for hand and aerial delivery) or \$300 per square mile (using rented helicopter equipment and paid operators). Costs for active surveillance include laboratory testing for rabies in animals as well as measuring antibody titers in the personnel involved. Laboratory costs were calculated assuming that the vaccine was 80% effective in reducing pre-epidemic rates of infection.

The Table presents two sets of model programs, assuming vaccine delivery costs of \$100 or \$300 per square mile, with and without salary payment for employees managing the project. The estimated net cost per square mile ranges from \$684 to \$1,547, and the lowest possible 20-year program cost is \$691,937. The potential benefits of the program in terms of a reduction in diagnostic laboratory costs and PEP are of the order of \$33,000. This translates into a reduction in the net cost per square mile from \$684-\$1,547 to \$657-\$1,520.

The models presented here do not take into account any

benefits from the ORV program, such as reductions in the need for PEP, decreases in the number of specimens processed by the state laboratory, and the saving in avoiding deaths of a person from rabies. Each year, three to four US citizens die from rabies, but there are no documented deaths in North Carolina since early 1950s.¹¹ Using other choices for the variables (vaccine effectiveness, larger buffer zones, different vaccine densities, or different discount rates) would influence the cost of the program.

Bait Distribution and Vaccine Risks

Bait distribution is a cooperative effort that requires participation of medical, veterinary, wildlife, and animal control communities, and many other state organizations. Detailed geographical information is needed to map the target area and to design the bait-dropping grids. Baits can be distributed by hand (on foot or from an automobile), or by air from planes or helicopters.⁹ The vaccine is packaged in a plastic sachet covered by a fishmeal polymer mix appealing to raccoons, who bite into the bait and ingest the liquid vaccine. The inclusion in some vaccines of markers such as tetracycline permits confirmation, through tooth or bone analysis, that the baits are reaching the target species. (Other animals also may eat the baits, but raccoons seem to be the most common consumers.)

The potential exists for human infection with the vaccinia virus. Although remote, this public health risk must be addressed, especially as it applies to the most susceptible: immunocompromised people, children, and the elderly.¹² It is reassuring to note that millions of baits have been distributed in other states without reports of people getting sick. Education of the public before and during bait distribution is important in limiting accidental contact with the baits. The vaccination program team should include physicians who can oversee accidental contact with the vaccine, administer rabies vaccine if needed, and assess antibody titers in program participants. All participants in the program must be vaccinated for rabies and have titers checked every two years.

Funding

Implementing an ORV program is difficult. The biggest challenges are obtaining the necessary funds and maintaining interest in a program that may last 20 years or more. Other states have raised funds from state and federal organizations and private donors. In Massachusetts, for example, the program incorporated the salary of state employees (part-time commitment), use of rented and state vehicles, state and federal laboratories, and volunteers.¹³

We conducted a random-digit telephone survey of 1,027 households in 43 Eastern North Carolina counties to deter-

Table. Summary of estimated costs for 4 models of a raccoon oral rabies vaccination (ORV) program

| Model | Baits per sq.mile | Bait-distribution cost per sq.mile | Staff time | Costs | | | |
|-------|-------------------|------------------------------------|------------|--------------|-------------|---------------|----------------|
| | | | | 20-yr. total | 1st 2 years | Avg. per year | Net per sq. mi |
| 1 | 150 | \$ 100 | Volunteer | \$ 691,937 | \$ 217,671 | \$34,597 | \$ 684 |
| 2 | 150 | \$ 100 | Salaried | \$1,206,694 | \$ 312,263 | \$60,335 | \$1249 |
| 3 | 150 | \$ 300 | Volunteer | \$ 991,207 | \$ 309,518 | \$49,560 | \$ 981 |
| 4 | 150 | \$ 300 | Salaried | \$1,505,064 | \$ 421,346 | \$75,298 | \$1547 |

mine citizens' understanding of rabies and rabies control. A majority of our respondents (57%) said that funds for an oral rabies vaccination program should come from the state. Interestingly, 23 % of people thought that funds should also come from pet owners, but rabies is not a problem that affects only pet owners. Virtually all people are directly or indirectly (through domestic animals) exposed to rabid wild animals. Two-thirds of the respondents would agree with adding a dollar to their taxes, but the remainder would not support increasing taxes to support the program.¹⁴

Is ORV Feasible?

The geography of the Outer Banks is uniquely suitable for control of movement of wildlife and for the maintenance of a rabies-free zone in the state. The geography of this area can effectively limit the advance of the epidemic. However, the program should not be undertaken unless we continue to use classic methods of control such as vaccination of pets, re-

moval of strays, treatment of exposures, and public health education. ORV is an adjunct to, not a substitute for, these methods; it cannot be used in isolation. Rabies monitoring throughout the program and in the surrounding areas is very important to determine whether the buffer zones are resisting the expansion of the epidemic.

Data from other states show the great potential of ORV in reducing wildlife rabies. As always, there are pitfalls. We must justify costs, identify funding sources, make long-term commitments, coordinate a large number of people and state agencies, and train personnel to coordinate the different aspects of the program (surveillance, laboratory, management of volunteers, vaccine distribution, and fund raising). Given the serious and potentially fatal consequences of contact with a rabid animal, the costs of this program seem reasonable. Its successful implementation would help not only the health of a limited area of North Carolina, but give us the expertise and experience that might allow implementation of these techniques elsewhere. □

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Carolina Physician's Bookshelf

Coping with Old Age: An Odyssey

by John B. Graham, MD, Professor Emeritus,
Department of Pathology, University of North
Carolina, Chapel Hill, NC
(Chapel Hill, NC: Ding Dong Press, 1998.)

Reviewed by Edward C. Halperin, MD,
Department of Radiation Oncology, Duke Univer-
sity, and Journal Deputy Editor

Dr. Graham has published extensively on blood clotting, inherited diseases in humans, and is the co-discoverer of blood coagulant factor X (Stuart factor). In his frequent contributions to the *North Carolina Medical Journal*, our readers have learned about Dr. Graham's experiences as a house officer in New York in the 1940s and his tour of duty with the US Army Medical Corps during and after the second World War. Dr. Graham has also published, locally in Chapel Hill, a short history of his war experiences (*Sand in the Gears*), as well as an in-house history of the Department of Pathology at UNC. The latter volume was recently reviewed in these pages.

This new paperback, about 270 pages long, begins with brief biographies of Dr. Graham and his wife, Ruby Graham. Most of the book is devoted to Dr. Graham's experiences and

coping strategies as they relate to Mrs. Graham's illnesses: stroke and memory loss.

In a series of dated entries, following the theme of letters to friends and family, Dr. Graham discusses his and his wife's experiences with local home health agencies, nursing homes, techniques for feeding Mrs. Graham, dealing with the finances related to chronic illness, and legal issues such as living wills.

The prose is clear and detailed. There are many useful tidbits such as a valuable discussion of how to handle nursing assistants provided by home health agencies and redesigning the home bathroom for use by an invalid.

This is largely a "how I am getting through day to day" sort of book. Dr. Graham doesn't touch on introspective issues such as whether or not it is in some sense "fair" or "just" that, after Mrs. Graham's years as a helpmate to Dr. Graham, caring for their children and supporting his career, he in turn is "paying her back" by caring for her during this illness. You won't read much about justice, religious rationalizations, or overt expressions of love here. This is the writing of a person who has his eye on getting through one day at a time and leaving the purple prose and philosophical musings to someone else.

Friends and acquaintances of the Grahams will be interested in the book. Others will find some useful information on coping with the problems of an ailing spouse at home.

Remembering Mr. Shawn's New Yorker: The Invisible Art of Editing

by Ved Mehta
(Woodstock, NY: The Overlook Press, 1998)

Reviewed by Edward C. Halperin, MD

I had a subscription to *The New Yorker* magazine from 13 years of age until my mid-30s. It arrived faithfully every week in its brown wrapper. *The New Yorker* was always stuffed full of material to read: long articles on public affairs, philosophy, the arts, and current events. There was also always a smattering of perfectly charming and peculiar articles about horse racing, football (only the Ivy league and

military academies were covered), dance, and arts. There were impossible to read movie reviews, and dense critiques of the ballet. Throughout my entire span of time with *The New Yorker*, it was edited by William Shawn, a legendary editor and arbiter of taste.

After Shawn retired/was fired, in the 1980s, the magazine decidedly changed, edited first by Robert Gottlieb, then Tina Brown. Its lengthy and learned articles were replaced by fluff about entertainment and the glitterati. I stopped my subscription.

For decades, Ved Mehta was one of *The New Yorker's* writers. An extraordinary writer on the subjects of philosophy, history, and his own personal experiences in India, the United States, and England, Mehta wrote with perfect attention to detail, dialect, and dialogue. His writing is even more

extraordinary when you consider that Mehta is blind.

In this memoir, *Remembering Mr. Shawn's New Yorker*, Mehta describes Shawn's techniques of detailed textual editing, selection of what articles were important to publish and not, and his mastery over the magazine.

As a Deputy Editor myself, I was interested in how carefully Shawn went over each individual writer's text and how he worked hard at making every sentence, punctuation mark, and paragraph as good as it could possibly be.

It appears that Shawn had at least two serious faults. One was his inattention to his own successor. I always thought that an important part of leadership was to provide for the organization to carry on after you are gone. (I have given some thought to this already as department chairman, even though I have only been at it for two years). Shawn's other fault was that he doesn't seem to have been a very good delegator. It wasn't clear who would run the magazine in his absence or who could step up to the plate if necessary. It was,

eventually, the lack of attention to the provision of a successor which lead to his unpleasant departure from magazine.

There is another lesson in Mehta's book. It is the difficulty in aligning the editorial goals of a magazine with the financial goals of its owners. *The New Yorker* has always been run as a for-profit enterprise. Eventually, there was a disconnect between what the editor wanted and what the owners wanted. This lead to a lot of unhappiness. I am sympathetic to this problem, given the recent contretemps between the Editor of JAMA and the Executive Director of AMA, which led to his sacking. In the end, however, I think that a certain tension is healthy. It is important that an editorial staff retain its independence and turn out the best publication it possibly can, while maintaining an appropriate interest in the bottom line.

In this book, as in his other works, Mehta's writing is magnificent, and I whizzed through all 400 pages. □



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Place: Charlotte Convention Center

Credit: up to 24 hours Category 1, AMA

Info: Brenda Arnes or Mary Anne Cox, CHS Office of CME,
1366 E. Morehead St., Charlotte 28204, 704/355-8631,
800/562-7314

Internet: <http://www.carolinas.org/symposium/>

May 19

NCMS 150th Anniversary Gala

Place: Raleigh Memorial Auditorium

Info: with the North Carolina Symphony, black tie optional;
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919/833-3836, fax: 919/833-2023

e-mail: dhammermeister@ncmedsoc.org

Internet: <http://www.ncmedsoc.org>

June 14-19

8th Annual Advanced Cardiovascular Interventions Symposium

Place: Westin Resort, Hilton Head, SC

Credit: up to 21 hours Category 1, AMA

Info: Carolinas HealthCare System/Charlotte AHEC Office
of CME, 1366 E. Morehead St., Charlotte 28204,
704/355-8631 or 800/562-7314

June 25

University of North Carolina Ophthalmology Residents' Day

Place: Dept. of Ophthalmology, UNC-Chapel Hill

Info: Mrs. Christine Cotton, CB#7040, UNC, Chapel Hill, NC
27599; 919/966-5296

June 26-29

2nd Annual Duke Cardiothoracic Update

Place: Hilton Resort, Hilton Head Island, SC

Info: Brenda Mickley, 919/681-3883, fax: 919/681-7893

e-mail: mickl002@mc.duke.edu

July 23-25

North Carolina Medical Society 29th Annual Sports Medicine Symposium

Place: The Royal Pavillion Resort, Pine Knoll Shores, NC

Credit: 6.5 hours, Category 1, AMA Physicians Recognition

Info: Dana Hammermeister, NCMS, 919/833-3836

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August 2-6

28th Emery Miller Medical Symposium

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Instructions for Authors

The *North Carolina Medical Journal* is a medium for communication with and by members of the medical community of this state. The *Journal* publishes six times a year: in January, March, May, July, September, and November.

The *Journal* will consider for publication articles relating to and illuminating medical science, practice, and history; editorials and opinion pieces; letters; personal accounts; poetry and whimsical musings; and photographs and drawings. Papers that relate to the present, past, or future practice of the health professions in North Carolina are especially pertinent, but manuscripts reflecting other perspectives or topics are welcomed. Prospective authors should feel free to discuss potential articles with the editors.

Manuscript Preparation

Prepare papers according to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (N Engl J Med 1991;324:424-8) with the following exceptions: 1) no abstract is needed; 2) no running title is needed; and 3) report measurements in metric units; use of the International System of Units (SI) is optional.

Submit a cover letter and a 3 1/2-inch computer disk that contains the text written in MS DOS- or Macintosh-compatible format. *Also enclose three hard copies of the text for review purposes.* Double space text with one-inch margins. *Please do not "format" the text* (e.g. no variations in type size, no bold face, no italics, no embedded endnotes).

Submit photographic illustrations, in duplicate, as high-quality color 35mm slides or 5-by-7 or 8-by-10-inch glossy prints, or as black-and-white glossy prints (5-by-7 or 8-by-10-inch). Label all illustrations with author's name, number them sequentially according to their position in the text, and indicate the orientation of the images, if necessary. *Do not write directly on the backs of prints.* This can damage them. If figures require printing in four-color process, we may ask the author to pay printing fees or a portion thereof.

Submit tables, charts, and graphs as hard copy and include copies on disk, in their original format and translated as TIFF, PICT, or EPS documents. Type all figure legends separately. Type and double-space all tables, one to a single sheet of paper. Tables must have titles and consecutive Arabic numbers.

Keep references to a minimum (preferably no more than 15), retaining those that document important points. The "Uniform Requirements" cited above contain reference format. We customarily list the first three authors for "et al"-type references. Authors are responsible for the accuracy and pertinence of all citations.

Avoid abbreviations entirely if possible; keep them to a minimum if not. When used, completely define abbreviations at the first point of usage in the text.

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A medically qualified editor reads all manuscripts and, in most instances, sends them out for further review by one or more other members of the North Carolina Medical Society. *Authors' cover letters must include a line that states that their submitted manuscripts are not under consideration for publication elsewhere. It is not the Journal's policy to reprint previously published articles.* Decisions to publish or not are made by the editors, advised by the peer reviewers.

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Aphorisms of the Month

Daniel Sexton, MD, Section Editor

"Pain"

Illness is the doctor to whom we pay most heed; to kindness, to knowledge we make promises only; pain we obey.

—*Marcel Proust*

As to pain, I am almost ready to say that the physician who has not felt it is imperfectly educated.

—*S. Weir Mitchell*

The art of life is the art of avoiding pain.

—*Thomas Jefferson*

Not only degrees of pain, but its existence, in any degree, must be taken upon the testimony of the patient.

—*Peter Mere Latham*

When two pains occur together, but not in the same place, the more violent obscures the other.

—*Hippocrates*

It is by poultices, not words, that pain is ended, although pain is by words both eased and diminished.

—*Petrarch*

A man deep-wounded may feel too much pain to feel much anger.

—*George Eliot*

Pain is no longer pain when it is past.

—*Margaret Junkin Preston*

Physical pain is not a simple affair of an impulse travelling at a fixed rate along a nerve. It is the resultant of a conflict between a stimulus and the whole individual.

—*Réné Leriche*

Pain, messenger of harm./Nature's poignant alarm.
Often man's wily friend:/To signal means to mend.

—*David Seegal*

Section editor is Dr. Dan Sexton, Box 3605, DUMC, Durham, NC 27710. e-mail: sexto002@mc.duke.edu

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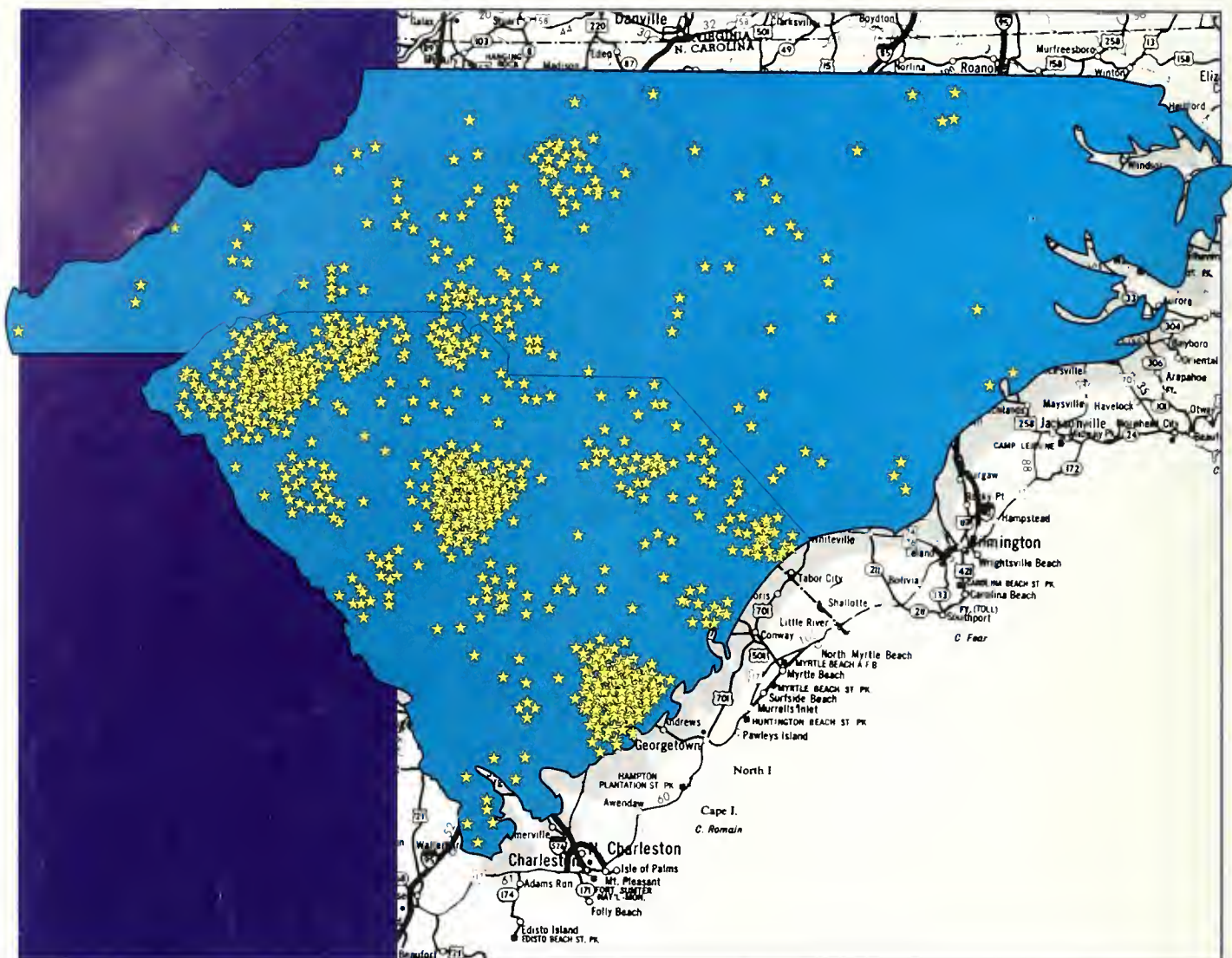
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The Official
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Medical Society

July/
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Volume 60
Number 4

North Carolina Medical Journal

For Doctors and Their Patients




Inside This Issue

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 - *Photodynamic Therapy*
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 - *Access to Medication for NC Elderly*
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- and More


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NORTH CAROLINA MEDICAL JOURNAL

For Doctors and their Patients

July/August 1999, Volume 60, Number 4

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—*Constitution and Bylaws of the North Carolina Medical Society*. Chap. IV, Section 3, pg. 4.

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North Carolina Medical Journal

FOR DOCTORS AND THEIR PATIENTS

July/August 1999 Volume 60, Number 4

Cover: "Welcoming Committee." This sunny summer watercolor is by Elise Weinrich, MD, whose paintings animate the offices and examining rooms at Durham Dermatology Associates, where she is a partner. Dr. Weinrich has been in private practice since 1982. She returned to painting five years ago after a 25-year hiatus.

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—Deans of the four North Carolina medical schools

WHERE DO WE COME FROM? WHAT ARE WE? WHERE ARE WE GOING?

Yesterday, at the Museum of Fine Arts, I had the chance to see Gauguin's masterpiece. Its title—and mine—comes from the questions he put in the left upper corner of that great, dark, mysterious painting: In French, *D'où venons-nous? Que sommes-nous? Où allons-nous?*

If Gauguin were our editor, he might have added some further questions: Why in the present age should any medical society want to publish a journal? Why, when the house of medicine is beleaguered front and back, don't we just say "Enough of journals and periodicals"? Would the world be any poorer if it lost even one more publication? Haven't the state medical societies of Florida, Pennsylvania, Delaware, Virginia recently abandoned their journals? Haven't the societies of New York and Ohio, more remotely, canceled their journals? If North Carolina were to follow suit, who would weep?

Well, I think the loss, even if not immediately apparent, would be great indeed. It is true that nowadays doctors see themselves embattled, surrounded by outside forces seeking to change, restrict, perhaps disband the medicine we have known. Health care management companies, alternative practitioners, optometrists, podiatrists, malpractice lawyers all want to foist on us their ideas of what they should do and what we should do and how we should do it. Without doubt medicine is engaged in a power struggle of spectacular proportions, a fight we might actually lose.

But, just as the soldier wounded in the press of battle may not realize that he has been injured—even fatally—until the fight is ended, so, I fear, we will not feel until too late the grave injury to the body medical that will result if the *North Carolina Medical Journal* is sacrificed to protect the legal and contractual aspects of medical practice. Narrowing the scope

of the Medical Society's function to mere opposition would cripple the very reasons that we exist as a *medical* society. Without the *Journal*, we will lose the irreplaceably distinctive voice of North Carolina medicine. We will have constricted the nature and dimensions of the dialogue among community and academy, practitioner and student and teacher, about the meaning of what we do. We will have squandered the opportunity to continue doing what no medical school in this state does—provide a voice for medical students and residents and fellows and practicing doctors. We will become less than we are now.

Let me see if I can explain this by analogy. In the first half of the 15th century, just as Europe was seeing the first cracks in the dense veil of ignorance that had lasted for nearly a thousand years, the medical school at Padua in Italy emerged as the beacon in the darkness of medical practice. The great Vesalius came to Padua as professor of anatomical studies, but, unlike all his predecessors, he was not content merely to read aloud the received "wisdom" of Galen's textbook while a prosector huddled over the stinking carcass, pointing to findings that "confirmed" the professor's prattle. No, Vesalius the professor himself came down from the podium and took the scalpel in hand. The results of his dissections, the great anatomical engravings that bear the stamp of personal observation, opened the gates to deduction and conclusion—to science.

While Vesalius labored in the dissecting room, his colleague Montanus began to take students to the bedsides of the patients, where all might see and hear together what the encounter with illness was really like. Montanus brought the gift of skepticism to his clinical teaching (in an era where therapeutics often did more harm than good, his motto was "In the treatment of disease, oftentimes to do nothing is to do

everything”) and Padua became the center of the medical universe. Students flocked to learn real medicine from real masters. There was nothing else like it anywhere.

Well, you might think, once the Paduans had got it right, all they had to do was continue what had been so well started. Not so. Fifty years after Vesalius and Montanus were gone, the school at Padua had been reduced from the pinnacle of inquiry and healing to a “mere school of pulse-taking and urine watching.” There are no records of how those later professors and practitioners explained what was happening to them and their school. Doubtless, they wanted to continue the course toward greatness that had been laid out for them. Doubtless, they thought that “minor” changes in what they did were in the best interest of efficiency and moving the school “ahead.” Doubtless, too, they were unaware that they let slip gradually out of their hands the very essence of what they wanted to be.

I am convinced that the Medical Society is on the brink of a Paduan crisis. I believe publication of the *Journal* elevates the Society’s level of professionalism. It celebrates not the business but the profession of medicine, and reinforces in doctors the dimly understood reasons underlying their daily activities. It offers all doctors in the state the opportunity to come together as equals in a way that nothing else does. Letting the *Journal* go will diminish the Society, and the profession itself.

I am asking all of you who read this to respond to the financial needs of the *Journal*. Each year, publishing those 66,000 copies of the *Journal* costs us about \$100,000 more than we can earn by advertising.



Until now the Society has supplied those funds from its membership dues (about \$12-13 per member per year). That subsidy ends this year. Unless we have \$100,000 *in hand by October 1 of 1999*, publication will cease.

You can do something about this. Already the North Carolina Medical Society Foundation has received on behalf of the *Journal* a number of generous contributions (several for as much as \$1000 and one for \$10,000 from Editor Emeritus Eugene A. Stead, Jr.), and we have approached several charitable foundations who have expressed an interest in helping. But that will not be enough. I am asking each of you readers to help, too. You can make a tax-deductible contribution to the North Carolina Medical Society Foundation, stipulating that the funds are to be applied to the *Journal* (these donations will be used for other projects of the

Foundation should the *Journal* fail). The numbers here are not insurmountable: 100 doctors contributing \$1000 will fund publication of the *Journal* in 2000; so will 1000 doctors contributing \$100. Pulling together, we can overcome the obstacle to survival. In the best of all possible worlds funds would be raised on behalf of the *Journal* sufficient to begin an endowment that would sustain in perpetuity. But now we need just to live. We need your help and we need it now. If we don’t succeed by October, we fail. Don’t let that happen. Send a check today.

—Francis A. Neelon, MD, Editor

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Letters to the Editor

Child Abuse—

Who Really Ought to Be in Jail?

To the Editor:

I read with interest your article on child abuse (NC Med J 1999;60:83-9). I have practiced pediatrics "forever," but only see a small part of the world from my office.

About four years ago, my wife and I went through the Department of Social Services training and licensing program and have learned a lot since then. One of our cases points out our horribly flawed system. This child came to us at age one, relatively marasmic, both abused and neglected. Reportedly, the mother had had one or two children taken by another state, but "that is not admissible evidence." The mother failed to comply with attempts to teach parenting or to become drug-free. Her parental rights are being severed, and her child is now in an adoptive home getting special help and (I hope) can become normal.

While all this was happening, the mother got pregnant—more welfare dollars—went through the clinic, and delivered by repeat C-section. I was not on service and another group cared for the baby. No one in the clinic or hospital was aware of the history until I "blew the whistle." Social Services came in, did a quick review, and said all was fine to go home. Two months later, in a frenzy, the mother fractured the baby's skull and arm. Now the new baby is in foster/adoptive custody and mom is serving jail time for child abuse.

This story is true—I lived it—and it gives me a dismal view of our legal and social system. There are voluntary agencies out there, but this mother is not rational enough to seek them. This is her third or fourth ruined child, and the system allowed them—*promoted* them! No mandatory birth control; no removal of the baby when a parent is certified as incompetent. For this last baby's existence and abuse, the mother was blamed and is in jail, but the system is the guilty party. The doctors, lawyers, judges, and Social Services workers should be serving time.

Charles M. Hicks, MD
The Pediatric Center
1914 Glen Meade Road
Wilmington, NC 28403

A Remarkable Life in Medicine

To the Editor:

With the untimely death, on March 9, of Dr. T. Reginald Harris of Shelby, health care in North Carolina lost a gifted and dedicated medical advocate and leader.

Reggie's talents and leadership potential were quickly recognized by those with whom he came in contact. He rapidly ascended the leadership roles for internal medicine. He became President of the American Society of Internal Medicine. In the North Carolina Medical Society, he became a Speaker of the House of Delegates, and President. He subsequently became Chairman of the North Carolina Medicine Society Delegation to the American Medical Association House of Delegates.

He served as Chairman of the AMA Council on Medical Services. As evidence of his signal leadership and willingness to tackle needed but unpopular causes, he also served as Chairman of the AMA Current Procedural Terminology Code Committee during one of its most tumultuous times. He was helping to develop a consensus between reimbursement for care provided and the documentation of services rendered at the time of his demise.

He was a member of the American College of Physicians Board of Governors when it engineered the merger of the American College of Physicians and the American Society of Internal Medicine. He was President of the North Carolina Medical Mutual Insurance Company and Chairman of the Cleveland County Health Department Board of Directors.

He performed his many activities with wit, compassion, humility, and the conviction that comes only from genuine concern. He did it, moreover, with infectious and inspiring enthusiasm. Beneath his folksy manner was a keen intellect. He had the vision of an idealist tempered with the practicality of a pragmatist. Foremost among his many accomplishments, Dr. Reggie Harris was a highly respected local physician, and a loving husband and father. I write in appreciation of a life well lived and in tribute to a remarkable physician.

John L. McCain, MD
2402 Camden Street SW, Suite 700
Wilson, NC 27893-4495

Guidelines for Letters: We welcome reader feedback. Type and double space all letters; keep length to under 500 words. We may occasionally publish longer letters as commentaries. We reserve the right to edit and abridge submitted text. Send letters to: *North Carolina Medical Journal*, Box 3910, DUMC, Durham, NC 27710, 919/286-6410, fax: 919/286-9219, e-mail: nash0004@mc.duke.edu

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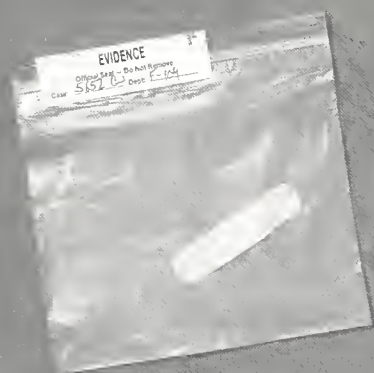


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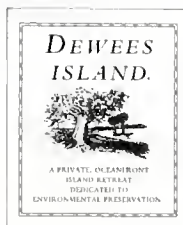
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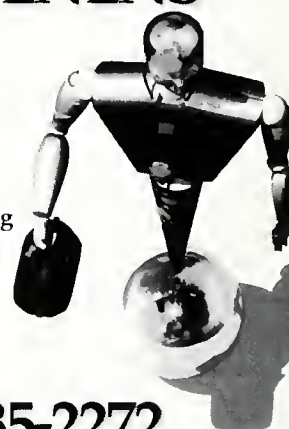
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Why Doctors Don't Volunteer at a Community-Sponsored Free Health Clinic

Michael K. Newman

At least 37 million people in the United States have no health insurance,¹ and an estimated 1.1 million of North Carolina's population of 7.4 million people are uninsured.² Traditionally, these uninsured patients have sought care at government health departments. There are thousands of county health departments throughout the state and the nation, but many have undergone large budget cuts. As a result, health departments are actively recruiting Medicaid and Medicare patients (who represent a guaranteed source of revenue) and turning away uninsured indigent patients. Appointments are being preferentially filled with Medicaid and Medicare patients, even though these patients have access to private practice physicians or managed care organizations. Indigent uninsured individuals are left without formal access to health care.

Many communities, recognizing the trend towards exclusion of the uninsured, have developed community-sponsored clinics as sources of free health care for indigent residents. Since the 1960s, over 200 free clinics have been established in the US without any federal support. In North Carolina alone, more than 15 free health clinics are listed by the Free Clinic Foundation of America (<http://www.mdeming.com/bradley/bradley5.htm>). One of these is the Helping Hand Clinic (HHC) in Sanford, North Carolina.

The HHC was established in 1991 by a Sanford physician and his staff because of the growing number of indigent patients needing acute health care. Now located in a new facility with three patient rooms, it serves 20-30 patients every Tuesday and Thursday from 6-9 PM. The clinic is

staffed each day on a rotating schedule by a volunteer physician, nurse, pharmacist, and receptionist. Clinical notes are kept on each patient, and supplies are donated by local and national businesses. The HHC refers patients needing consultation to a panel of local medical specialists who provide free health care in their offices on a case-by-case basis.

As a medical student volunteer in the clinic, I became interested in its organization and effectiveness. I met with several local physicians, HHC board members, and HHC managers, to ascertain the major limitations of the clinic. There was consensus about three major points: (1) there are too few physician volunteers; (2) too many patients needing chronic care rely on the clinic, which is ill-suited to provide continuity of care; and (3) a relatively high proportion of nonindigent and insured patients seek care at the clinic. Additional discussion showed that the small number of available physician volunteers was the most pressing factor, because a physician must be present for the clinic to function. Only 15 of the community's 60 physicians actively volunteer at HHC. I decided to look in a more formal way at why many local physicians do not volunteer.

Volunteerism is an old and honored concept in this country, and physicians have had a place at the forefront because of their tradition of social advocacy and service for the poor, whether it be rushing to aid during disasters or epidemics, or simply seeing needy patients free of charge.^{3,4} Nationwide, about 64% of physicians volunteer an average of 3 hours per week to provide for needy patients.⁵ In addition, many physicians volunteer in other ways—serving on community boards, supervising youth athletic events, and sitting on hospital committees.

Even with this already good record of physician volunteerism, there is a national effort to better it. North

Mr. Newman is a third-year medical student at UNC School of Medicine in Chapel Hill. He can be reached via email at newmanm@med.unc.edu.

Table. Responses to Survey.

| Question | Response | | | | | | |
|---|---------------------------|-------------------------------|--------------------------|------------------------|----------------------------|-------------------------|---------------------------|
| | Yes | No | | | | | |
| Have you heard of HHC? | 29 | 0 | | | | | |
| Have you volunteered at HHC in past year? | 11 | 18 | | | | | |
| Why haven't you volunteered at HHC? | <i>Unaware of opp'ty</i> | <i>Weak prim. care skills</i> | <i>Live too far away</i> | <i>Not inter-ested</i> | <i>No time</i> | | |
| | 0 | 7 | 2 | 1 | 9 | | |
| Total no. of times you have volunteered: | <i>1-5</i> | <i>5-10</i> | <i>>10</i> | | | | |
| | 2 | 5 | 8 | | | | |
| When did you last volunteer? | <i>Past 6 mos.</i> | <i>1 yr. ago</i> | <i>>2 yrs. ago</i> | | | | |
| | 11 | 3 | 2 | | | | |
| How do you rate facilities? | <i>Poor</i> | <i>Good</i> | <i>Excellent</i> | | | | |
| | 3 | 11 | 0 | | | | |
| How do you rate staff you worked with? | | | | | | | |
| | 0 | 6 | 8 | | | | |
| How convenient were the hours? | <i>Inconv'nt</i> | <i>Adequate</i> | <i>Ideal</i> | | | | |
| | 1 | 13 | 1 | | | | |
| Was there difficulty with the following? | <i>Spanish transl'n.</i> | <i>Efficiency</i> | <i>Equipm't.</i> | <i>Supp't. staff</i> | <i>Patient vol.</i> | <i>Liability</i> | |
| | 11 | 4 | 8 | 8 | 2 | 1 | |
| What would make volunteering better? | <i>Provide translator</i> | <i>>1 doctor /session</i> | <i>Newer equipm't</i> | <i>More staff</i> | <i>Fewer pts. /session</i> | <i>Enlarge facility</i> | <i>Change clinic hrs.</i> |
| | 6 | 10 | 10 | 5 | 3 | 11 | 1 |

Carolina's Dr. James Davis, in his 1988 presidential address to the American Medical Association, called on physicians to spend "four hours a week serving the public in the way you think is most helpful."⁶ The Society of Physicians Who Care asked physicians to "devote one day a month to caring for persons who are unable to afford medical services."⁷

Of course, all these demands on physicians have sometimes led to the volunteer fatigue described by Clothier in his article "Are you volunteered out?"⁸ In light of both the motivations and pressures of volunteerism, it is perhaps not surprising that the volunteer physician staff at HHC represents only one fourth of the practicing physicians in the community. In this paper I describe what I discovered when I surveyed physicians about why they do or do not volunteer at the HHC and about ways to make the clinic setting more attractive to physician volunteers.

Methods

I derived the questions used in my survey (see Appendix) from discussions with local physicians, HHC board mem-

bers, and managers. The questions were intended to reveal physician perceptions of weaknesses of the clinic and to allow additional comments or suggestions. The two-page survey allowed respondents the options of including their name and indicating any interest in volunteering at the HHC. To maximize physician response, survey packets included a self-addressed, stamped envelope and a cover letter describing the purpose of the survey, the date by which the survey was to be returned, and additional contact information.

The surveys were distributed in two rounds. In the first round, survey packets were placed in the mailboxes of the 60 physicians at Central Carolina Hospital in Sanford, NC. Exactly one month later, 17 packets were distributed to family practice, internal medicine, and emergency department physicians (only) who had not responded to the first round. Physicians in these specialties were targeted for the second round because their broad base of medical knowledge makes them the most desirable volunteers. Different stamps were used for each round, allowing me to differentiate which round physicians responded to. Two months after the initial distribution, all surveys were collected and the data were analyzed.

Results

Of the 60 community physicians surveyed, 27 (45%) responded. The response rate for the first round of surveys was 40% and for the second, 18%. Most physicians completed the optional name and field of medicine questions. Only 28% of respondents remained anonymous.

Results of the survey are shown in the Table. All respondents had heard of the HHC; 48% had volunteered at the HHC within the past year. Reasons for not volunteering were few, but "no time" and "weak primary care skills" were the most common responses. Additional write-in comments included "moved away," "too many patients to see," "specialty interests only," "volunteer at other places," and "want to spend time with children." Some specialty physicians mentioned that they provide free care to patients referred in consultation from the HHC.

Most of the physicians who had volunteered at the HHC had done so frequently and generally approved of its resources and hours. The problems arising from volunteering were numerous. Most frequent were complaints about lack of Spanish translation, old equipment, and erratic presence of a pharmacist. Recommendations for improvements included "need more physician volunteers," "expand pharmacy stock," and "need more pharmacist volunteers." Other comments included the recommendation that HHC information be distributed to physicians annually, and the observation that patients needing chronic care came sporadically and thus were not well controlled.

Discussion

The overall response rate of 45% was higher than expected. All respondents had heard of the HHC; in fact, a disproportionate number of respondents were already active volunteers at the HHC (11 of the 15 active volunteers responded, accounting for 41% of the surveys returned). This suggests that the 33 physicians who did not respond to either round had minimal interest in or knowledge of the HHC.

Malpractice liability has been a big concern for physicians in recent years because of the increasing number of malpractice suits, but that issue was noted by only one

respondent. The overall lack of concern about malpractice may be due to awareness of the state liability laws. Starting in the mid-1980s, North Carolina and many other states passed laws granting immunity from liability for physicians who provide free health care.⁹

The survey results suggest that three major improvements would attract more physicians to HHC at little additional cost: (1) recruit volunteer Spanish translators from the community to facilitate care of the large number of indigent Hispanic immigrants in the area; (2) limit the number of patients seen at each clinic session to avoid overwhelming the physician volunteers with unrealistically high volumes of patients; (3) recruit more pharmacist volunteers, so that physicians will not be burdened with finding samples to distribute and will have more time for direct patient care.

Providing Spanish translation, limiting patient load, and maintaining a volunteer pharmacist on staff would modify

"Providing Spanish translation, limiting patient load, and maintaining a volunteer pharmacist on staff would modify the three most pressing physician stressors at the HHC. It is my hope and expectation that this would lead to increased physician recruitment."

the three most pressing physician stressors at the HHC. It is my hope and expectation that this would lead to increased physician recruitment. There are also other ways to increase physician involvement in free indigent health care. For example, in 1992, 55,656 US physicians were not in active practice.^{7,11} Retired and semi-retired physicians represent an important untapped resource of possible volunteers. Volunteerism allows them to remain involved in the community and to continue caring for patients without the burden of liability risk, budgets, or demanding schedules. Retired physicians often cite liability concerns,¹² but this is not an issue in North Carolina because of legal immunity from liability. Other

sources of medical personnel are physician assistants and nurse practitioners, but there are few of these clinicians in the Sanford community.

It would be possible to increase physician involvement with a complete change of setting to make care of indigent patients more convenient. For example, the Racine [Wisconsin] County Health Network screens indigent patients and then refers them for daytime appointments with local volunteer physicians at private offices.¹³ This model makes the work of volunteering much easier and keeps physicians from feeling overwhelmed with indigent patients, but it does have drawbacks. Patients must put out extra effort to obtain care, and the community loses some of the pride and symbolism that comes from an autonomous indigent care clinic.

Conclusions

My survey indicates that physician involvement in providing health care to indigent patients at the HHC could be increased without additional cost by (1) providing a volunteer Spanish language translator, (2) limiting patient load, (3) consistently providing a volunteer pharmacist, and (4) recruiting retired physician volunteers. Other options include recruiting physician assistants and nurse practitioners or modifying the whole structure of the clinic to a physician referral system.

Update

The results of my study were communicated to the managers

of the HHC, and several changes have been implemented. There is presently a volunteer Spanish translator scheduled for every evening that the clinic is open. There is a new policy stating that each physician can limit the number of patients to be seen. Future efforts will focus on recruiting more volunteer pharmacists and informing local physicians of these modifications.

Acknowledgments

I would like to thank Judy Jackson, coordinator and part founder of the HHC, for her generous help in providing me with vital information about the HHC over the course of several interviews. □

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SURVEY QUESTIONNAIRE

Have you heard of the Helping Hand Clinic (HHC)? Yes No

Have you volunteered at the HHC in the past year? Yes No

If no, why not (check all that apply)?

☐ Didn't know there is an opportunity to volunteer there

☐ Weak primary care skills

☐ Live too far away

☐ No interest

☐ No time

☐ Other _____

If you have volunteered at the HHC, please answer the following:

| | | | |
|--|--------------|------------|--------------|
| How many times (approximately)? | 1-5 | 5-10 | >10 |
| When was the last time (approximately)? | <6 mo. ago | 1 year ago | >2 years ago |
| How do you rate the facilities? | poor | good | excellent |
| How do you rate the staff you worked with? | poor | good | excellent |
| How convenient were the HHC hours? | inconvenient | adequate | ideal |

Were there difficulties with any of the following (check all that apply)?

☐ Spanish language translation

☐ Efficiency

☐ Equipment (instruments or supplies)

☐ Support staff (receptionist, nurse, pharmacist—circle all that apply)

☐ Excessively high volume of patient

☐ Liability

What improvements do you think will make the HHC a better environment for physicians to volunteer (check all that apply)?

☐ Limit the number of patients that can be seen in one evening

☐ Move to a larger facility

☐ Obtain better/newer equipment and supplies

☐ Have more than one provider volunteer each evening

☐ Provide a Spanish translator

☐ Change the clinic hours

☐ Other _____

Other comments, suggestions, or questions: _____

OPTIONAL

Name _____

Field of Medicine _____

Are you interested in volunteering at the HHC in the future? Yes No

If yes, please provide us with your office phone number: _____

The Rise and Fall of National and North Carolina Policies Addressing Medication Access for Older Adults

Heather K. Altman, MPH

In November 1998, NBC Nightly News broadcast a report called "Bitter Pill," an account of how the high cost of prescription medications affects Americans aged 65 and older. The report focused on tough decisions faced by the uninsured and underinsured about whether to buy medications or pay other bills. The broadcast drew public attention to a serious health care crisis, one that older adults, caregivers, and health care policymakers struggle with every day—how to pay for needed prescription drugs.

The single largest health care expense for older adults in the US,¹ prescription drug costs are a leading component of catastrophic out-of-pocket health care costs, second only to expenses of long-term care.² According to AARP, the American Association of Retired Persons, drug costs account for 34% of older adults' total health care bill—more than either doctor visits (31%) or hospital admissions (14%).¹ According to the Health Care Financing Administration (HCFA), about 89% of all older adults used one or more prescription drugs in 1997.³

The large amounts of money allocated to prescription drugs for older adults are the result of several factors: (1) The elderly use more prescription drugs: At 12% of the U.S. population, they consume 35% of all prescription drugs.¹ (2) Prescription drugs are expensive: In 1997, the average older adult spent \$742 for prescription drugs, with a projected increase to \$1009 by 2005.³ (3) Drug costs are usually borne directly by patients: Medicare does not pay for out-patient

prescription drugs, and the cost of a supplementary policy with drug coverage is out of reach for many older adults.³ The number of elder Americans with little or no drug coverage is estimated at 19 million.¹

Various national and state policies have tried, with mixed results, to address the issue of older adults' access to prescription drugs. In this paper I describe the rise (and in many cases the fall) of these initiatives, and explore several options for prescription drug coverage that have the potential to help the problem.

National Policies Including Prescription Drug Coverage

Five national policies or programs have addressed the high cost of prescription drug coverage: the Medicare Catastrophic Coverage Act of 1988, President Clinton's Health Security Act of 1993, the National Bipartisan Commission on the Future of Medicare, the expansion of Medicare managed care programs, and the Medicaid Rebate Law of 1991. As these very different policy initiatives have demonstrated, it is difficult for the federal government to establish its role in increasing access to prescription drugs. The problem is that expanding Medicare to cover prescription drugs would cost about \$20 billion annually.¹ No doubt the high price tag explains why these policies have fared so poorly in Congress.

Medicare Catastrophic Coverage Act of 1988. Medicare did cover prescription drugs after the enactment of the Medicare Catastrophic Coverage Act (MCCA) on July 1, 1988. This law created the most significant expansion of benefits under the Medicare program since its inception in 1965,⁴ but it was short-lived. On November 22, 1989, 17 months after its enactment, the MCCA was repealed because of controversy about financing and lack of long-term benefits.⁵

Ms. Altman is a recent graduate from the Department of Health Behavior and Health Education at the University of North Carolina at Chapel Hill School of Public Health. Her interest in medication assistance policies stems from her internship with Alamance ElderCare in Burlington, NC. Her internship was sponsored by the Duke Long Term Care Resources Program's Leadership in an Aging Society Internship Program and the UNC Institute on Aging.

In addition to covering prescription drugs, the MCCA removed the requirement of prior hospitalization for home care coverage, and provided income protection for spouses of nursing home residents.⁶ It also established the U.S. Bipartisan Committee on Comprehensive Health Care, known as the Pepper Commission, to make recommendations about the financing and delivery of long-term care services to the elderly and disabled.⁶

The idea of the MCCA was acceptable to many older adults, but its financing was not. Beneficiaries were to pay for the services through increased premiums, the size of which was linked to beneficiaries' income.⁵ This meant that the MCCA was going to be financed largely by premiums paid by middle- and upper-income beneficiaries, a provision that upset many advocacy groups. The AARP supported the legislation, "because its advantages in improved benefits outweigh disadvantages of the financing mechanism,"⁷⁴ but the complexity of the MCCA and the financing structure "permitted opposition groups to promote misinformation concerning the bill and the Medicare program."⁷⁵ A widespread media campaign against the MCCA succeeded in undoing it. "Moral economy concerns with the reciprocity, fairness, and just taxation . . . explain the intensity of the 'senior revolt' against [MCCA]."⁷⁷

Despite proposals outlining funding alternatives, Congress could not agree on a more acceptable financing structure, and repeal rather than modification was the result,⁸ although two key aspects did stay intact (the spousal protection measure and the Pepper Commission).⁶

The collapse of the MCCA had major public policy implications for older adults. The "Catastrophic Coverage debacle left a legacy of frustration, bitterness, and Congressional distaste for any new health legislation for the elderly."⁷⁶ Furthermore, "the [MCCA] catastrophe . . . eroded the political legitimacy of the old, while at the same time demonstrating the raw political muscle of [older adults and older adult advocacy groups]."⁷⁷

Since the MCCA's repeal in 1989, a few national policies have attempted to provide coverage for prescription drugs. What follows is a brief discussion of other initiatives that have had varying levels of success in increasing older adults' access to prescription drugs.

President Clinton's Health Security Act of 1993. As part of the President's plan for national health care reform, the Health Security Act of 1993 called for expanding Medicare to include prescription drug coverage under Medicare Part B.⁹ In addition, Medicare beneficiaries were to have a broad range of benefits and options through expanded managed

care plans, many of which would cover prescription drugs as part of their basic benefits package. The Health Security Act of 1993 had little success in Congress, but it was "the health policy proposal that has paid the most attention to long-term care issues in many years,"⁷⁶ recognizing the need for prescription drug coverage for older adults. Opposition continues, however, to such an expansion of Medicare.

National Bipartisan Commission on the Future of Medicare. In 1998-99 the National Bipartisan Commission on the Future of Medicare was convened by Congress and the President to recommend long-term solutions to Medicare's recurrent funding crises. In addition to struggling with how to ensure Medicare's financial solvency, one of the key issues that the Commission debated was adding coverage for prescription drugs for Medicare beneficiaries. In fact, failure to cover prescription drugs was one of the issues that led some Commissioners not to support the Chairman's final plan. In the end, the Commission did not have the super majority vote

needed to pass recommendations to Congress. However, it is encouraging that the majority of Commissioners indicated that prescription drugs should be covered in some form in future plans.

Medicare Managed Care. Increasingly, older adults are obtaining prescription drug coverage through managed care plans that have contracted with HCFA to provide services to Medicare beneficiaries. "Many plans promote preventative health care by providing extra benefits such as eye examinations, hearing aids, check-ups, scheduled inoculations and prescription drugs for little or no extra cost."¹⁰

Unfortunately, an unintended effect of lower-than-expected Medicare reimbursements following the Balanced Budget Act of 1997 has led some managed care plans to terminate their contracts with HCFA.¹¹ As a result, many older adults are losing prescription drug coverage. According to HCFA, "Members [can] enroll in other managed care plans available in their area which may cover prescription drugs. However, the Medigap policies that must be made available to members of terminating HMOs . . . do not include prescription drug coverage. Similarly, the requirement that terminating HMOs make certain supplemental coverage available does not require them to make arrangements that include prescription drug coverage."¹²

Even older adults who are able to continue with a managed care plan may find their prescription drug benefits terminated or limited because the plan considers coverage too costly. Massachusetts and some other states want managed care plans to provide Medicare enrollees with the same

"The Catastrophic Coverage debacle left a legacy of frustration, bitterness, and Congressional distaste for any new health legislation for the elderly."

benefits that general enrollees receive, but managed care plans argue that they need not provide more service than is provided by HCFA.¹¹ As a result many older adults are in jeopardy of losing prescription drug coverage.

Medicaid Rebate Act of 1991. Another approach to increasing older adults' access to prescription drugs focuses not on expanding Medicare but on developing policies to control the actual costs of medications. The 1991 Medicaid Rebate Law specified that "drug manufacturers must enter into a rebate agreement requiring them to give the Medicaid program their 'best price'."¹³ Furthermore, in 1993 manufacturers had to give Medicaid a minimum of 15% off average wholesale prices, saving Medicaid an estimated \$3.5 billion.¹³ This law is important for two reasons. It helps older Medicaid recipients by improving the financial solvency of the program. And it is an example of how the federal government can regulate drug prices. Remember, though, that drug prices are only part of the problem; rising utilization (and over-utilization) also contribute.

North Carolina Policies Regarding Prescription Drug Coverage

Because national programs do not cover prescription drugs for older adults, many states have created their own policies. In North Carolina, these have focused on expanding Medicaid eligibility and benefits for the large number of older adults without prescription drug coverage (in 1995, approximately 47%).³

North Carolina: Medicaid Expansion. HCFA does not mandate prescription drug coverage by Medicaid, but North Carolina and other states do provide coverage for which they receive matching funds.¹⁴ Medicaid recipients in North Carolina can get up to 6 prescriptions per month for a copayment of \$1.00 for each prescription.³ During the 1995-1996 federal fiscal year, Medicaid expenditures totaled approximately \$125,000,000 for prescription drugs for 116,500 older adults.³ These totals do not take into account manufacturers' rebates to Medicaid, which average about 20% per prescription.³

These figures may seem generous, but income eligibility guidelines have restricted drug benefits to only the poorest older adults in North Carolina. As of January 1, 1999, however, the North Carolina General Assembly has raised the income ceiling of eligibility for older adults and disabled persons from 37% of the federal poverty level (\$2979 annual income) to 100% of the federal poverty level (\$8050 annual income).¹⁵ Older adults make up the vast majority of the estimated 35,867 North Carolinians affected by this policy (Andy Wilson, Medicaid Eligibility Policy Unit, NC Divi-

sion of Medical Assistance. Personal communication, November 1998), but, notably, the new policy does not remove the need for them to "spend down" to become eligible for Medicaid. "If a person's income is even a few dollars over the \$8050 limit then they will still have to spend down to the 37% federal poverty limit before they can qualify for Medicaid."¹⁵

The new Medicaid policy, though it demonstrates the state's growing commitment to helping older adults, still falls far short of reaching the estimated 258,000 North Carolinians with incomes at or below 200% of the federal poverty limit. This is the group of older adults least likely to have prescription drug coverage.³

Seven state programs other than Medicaid help purchase drugs for specific populations, including persons with epilepsy, kidney disorders, HIV/AIDS, certain mental health conditions, and medical eye diseases. In addition, migrant workers and some patients needing vocational rehabilitation also receive prescription drug benefits.³

"Another approach . . . focuses not on expanding Medicare but on developing policies to control the actual costs of medications."

Policy Options for Prescription Drug Coverage. In 1997, the North Carolina Division of Aging published "A Study of Options for Making Prescription Drugs More Affordable for Older Adults."¹³ This report outlined several possible solutions to the problem of older North Carolina adults with no prescription drug coverage: implement state-funded prescription assistance programs; use 1115 Medicaid waivers to provide prescription drug coverage for certain groups; extend Multi-State Purchasing Alliance discounts to private citizens; extend Medicaid discounts to enrolled qualified Medicare beneficiaries and specified low-income

Medicare beneficiaries; encourage AARP to implement a marketing campaign for its "Member Choice" drug discount enrollment program; educate consumers about prescription drug use; implement cost-wise buying by local drug assistance programs; add a prescription drug benefit to one or more of the lower cost Medicare supplements.³ These options vary in terms of cost to the state and potential impact on older adults, and some have little chance of being implemented in North Carolina. For example, the HCFA requirement of budget neutrality makes Medicaid 1115 waivers impossible.

A state-funded prescription drug assistance program offers the greatest coverage to the most older adults, but it is the most expensive option. Still, 11 states have implemented such programs for low-income older adults not eligible for Medicaid.³ Common features of these programs include funding from general revenues (although some use lottery, casino, and tobacco tax income), coverage for individuals age 65 and older, eligibility at income levels ranging from 100% to 225% of federal poverty level, manufacturer rebates through Medicaid, co-payment requirements, and coverage

for either all or certain specified prescription drugs.³

The North Carolina Division of Aging estimated the costs of a state-funded prescription drug assistance program for non-Medicaid eligible low-income older adults. They used three coverage scenarios: (1) Coverage for qualified Medicare beneficiaries and specified low-income Medicare beneficiaries not receiving regular Medicaid coverage for drugs. By this model, 57,955 persons would have been eligible in 1998 (at a cost of \$17.4 million) and 68,764 in 2003 (for \$20.6 million). (2) Coverage for people age 65 and older with incomes at or below the federal poverty level who do not have drug coverage. This would have made 49,278 persons eligible in 1998 (for \$14.7 million) and 61,479 in 2010 (for \$18.4 million). (3) Coverage for people age 65 or older with incomes below 200% of the federal poverty level. This would make 263,808 persons eligible in 1998 (for \$79.1 million) and 333,053 in 2010 (for \$99.9 million). The third model would cover the most people, but it also carries the highest price tag.³

In contrast to the high-cost option of a state-funded drug assistance program, AARP could institutionalize and market its Member Choice program (a prescription drug discount program) at no cost to the state and with a potential coverage of 456,840 North Carolina AARP members. For a \$10 annual fee, each participant would reap an annual savings of about \$200. Consumer education about prescription drugs by local drug assistance programs, and streamlining and standardizing the often confusing and bureaucratic "red tape" of drug manufacturers' assistance programs represent other ways to improve older adults' access to medications at minimal or no cost to the state.³

Low-cost Medicare supplement plans that offer a drug benefit represent the last option to be discussed. At present, only the most expensive such plans cover prescription drugs. The North Carolina Division of Aging has described two potential plans to provide drug benefits at reasonable cost. One is a national plan, to be promoted by work with Congress and the National Association of Insurance Commission. A second, "more expeditious option" would encourage the North Carolina Insurance Commissioner to authorize additional Medicare supplement plans. According to the Seniors' Health Insurance Information Program, the cost of offering a drug benefit to a lower cost plan would be \$31 per month. While feasible, this plan would affect mostly moderate- and high-income older adults, not those most in need of help who usually cannot afford any supplemental insurance.³

National Options. The policy options discussed in this paper focus primarily on North Carolina initiatives, because the

high economical and political costs make nationally sponsored and funded programs out of reach, at least for now. There is hope, though, that future changes in the Medicare program will recognize the impact of prescription drug use on the health of older adults and incorporate prescription drug coverage into the standard benefits offered. Expanding Medicare benefits to include prescription drug coverage, however, will require a fundamental shift in how services are financed and what benefits are offered. Increased premiums, increased taxes, and shifts away from other covered services may be needed to ensure that prescription drugs are covered.

All policy initiatives, whether national, state, or local, must include education of the public about the proposed program or policy. Information should be provided about the importance of prescription drug coverage and how the program is to be financed and administered. One of the most important lessons to be learned from the failure of the

Medicare Catastrophic Coverage Act is that widespread confusion and misinformation will lead to the downfall of even the most well-intentioned programs and policies.

Conclusion

Over the years a number of national and state policies have attempted to provide prescription drugs for older adults. Unfortunately, many of these initiatives failed or involved too few older adults to make an impact on the problem. Policy makers point to the high cost of prescription medications as the reason for excluding coverage. According to Stephen Soumerai, chair of Harvard University's Drug Policy Research Institute, however, "even higher costs loom when people don't get adequate access to prescription drugs...elderly people who don't get sufficient medication often get too

sick to stay independent and end up in the hospital or a nursing home, where care is far more expensive".¹

There is research to back up Dr. Soumerai's assertion. For example, Prutting and colleagues reported that "patients without prescription benefits present a significant challenge to health care providers. The inability of patients to afford medication may serve as a barrier to adherence and may ultimately result in poor patient outcomes".¹⁶ States that have implemented pharmaceutical assistance programs have seen an increase in the use of prescription medications by non-Medicaid, low-income elderly and a reduction in enrollees' use of Medicare-reimbursable health services such as inpatient hospital costs and admissions to nursing homes.¹⁷

The absence of national or state initiatives covering prescription drugs leaves communities to grapple with this

"Even higher costs loom when people don't get adequate access to prescription drugs . . . people who don't get sufficient medication often . . . end up in the hospital or a nursing home, where care is far more expensive."

issue on their own. Social service agencies, community groups, religious institutions, free or low-cost clinics, and pharmaceutical companies' drug assistance programs are just a few of the myriad of options communities have used to ensure that older adults have access to medications. Until more comprehensive national and state policies are available, communities will continue to struggle with a complex and fragmented safety net for older adults who need prescription medication. □

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A Woman with a Big Belly, Fever, and Pain

Section on Gastroenterology

Wake Forest University School of Medicine

February 1999

PRESENTOR: Vaman S. Jakribettuu, MD, Fellow in Gastroenterology

DISCUSSANT: Joel T. Bruggen, MD, Assistant Professor of Medicine

A 60 year old woman complained of generalized abdominal pain for one day, and increasing abdominal girth. For seven days she had noted low-grade fevers, but denied chills or rigors. The patient had taken diuretics for the past three years for treatment of ascites and peripheral edema. By report she had drunk one fifth of vodka daily for the past 20 years. She had had no surgeries, but there was a remote history of subdural hematoma. She was taking l-thyroxine for hypothyroidism as well as ranitidine, spironolactone and furosemide.

*Two months earlier she had been hospitalized for similar symptoms and found to have ascites. Culture of the ascites fluid had grown *Streptococcus fecalis*, and spontaneous bacterial peritonitis (SBP) was diagnosed. She recovered after treatment with intravenous antibiotics. Occult fecal blood had been discovered during this hospitalization, but no source of bleeding was found. Colonoscopy had shown only sigmoid diverticulosis; upper gastrointestinal endoscopy had revealed a peptic stricture of the esophagus, but no varices.*

On physical examination, the patient had a temperature of 101.1 F, blood pressure of 98/60, pulse of 114, and respiratory rate of 24. There was no jaundice, but there were rare spider angiomas. She was alert and oriented. She had no asterixis. There was no jugular venous distention or peripheral edema. The chest was clear to auscultation. The heart rate and rhythm were regular and there was no murmur, gallop, or rub. The abdomen was distended but not tense; shifting dullness was present. Bowel sounds were present, but hypoactive. There was generalized tenderness to palpation of the abdomen, but no localization, guarding, or rebound tenderness. The liver edge was palpable 3 cm below the right costal margin; the spleen was not palpable.

DR. BRUGGEN: This patient's history is consistent with alcoholic cirrhosis. She had previously documented ascites and a recent episode of spontaneous bacterial peritonitis. The physical exam again suggests the presence of ascites, and the fever and abdominal tenderness raise the possibility of recurrent SBP. The differential diagnosis in this case would include complicated peptic ulcer disease, acute cholecystitis, pancreatitis, appendicitis, diverticulitis, pelvic inflammatory disease, and urinary infection. Prompt laboratory evaluation, upright abdominal film, and diagnostic paracentesis are indicated.

Distinguishing Distention

In patients with abdominal distention, physical examination can help distinguish ascites from other causes of distention. Prospective, blinded studies have shown that dullness on percussion of the flanks, shifting dullness, and fluid wave best correlate with ultrasound in detecting ascites.¹ In the setting of cirrhosis or cardiac disease, the *absence* of peripheral edema makes ascites very *unlikely* unless, as in our case, the patient has been treated with diuretics. Finally, jugular venous distention is

distinctly unusual in cirrhotic ascites, and its presence should raise the suspicion of a primary cardiac etiology. Ultrasound is the gold standard for determining the presence of ascites; computed tomography (CT) is sensitive and specific, but more expensive and involves radiation exposure.

Causes of Ascites The most common cause of ascites is portal hypertension, and cirrhosis is by far the most frequent cause of portal hypertension.² Other causes include congestive heart failure, cor pulmonale, restrictive cardiomyopathy, constrictive pericarditis, inferior vena caval web, Budd-Chiari syndrome, hepatic vein occlusion, massive liver metastases, polycystic liver disease, schistosomiasis, and portal vein thrombosis. The two main causes of ascites *not* mediated by portal hypertension are malignant ascites and tuberculous ascites. Other causes of ascites in adults (nephrotic syndrome, biliary ascites, pancreatic ascites, chylous ascites, hypothyroidism, eosinophilic gastroenteritis, and systemic lupus erythematosus) are much more rare.

One important development of the past 15 years has been the demonstration of the diagnostic utility of the Serum-Ascites Albumin Gradient (SAAG = serum albumin - ascites albumin) in the evaluation of ascites. The SAAG correlates better with underlying etiologies than the historic distinction of transudate vs exudate on the basis of ascites total protein level.¹ A SAAG ≥ 1.1 is seen in ascites due to portal hypertension. A SAAG < 1.1 is seen in malignant, tuberculous, nephrogenic, biliary, pancreatic, and inflammatory ascites.

Etiological Diagnosis The diagnosis of spontaneous bacterial peritonitis (bacterial infection of ascitic fluid without an intraabdominal, surgically treatable source of infection) must be considered in any patient with ascites and abdominal pain. SBP is thought to arise from translocation of gut bacteria into peritoneal fluid through an altered but unruptured intestinal wall. Occult SBP is not uncommon in ascitic patients even without abdominal pain or fever. About one-quarter of all cirrhotic patients admitted to hospital can be shown to have SBP.³ The incidence is particularly high in patients admitted for gastrointestinal bleeding, in those with an ascites fluid total protein of < 1 gm/dl, and in patients with a prior history of SBP. The recurrence rate in the year following the first episode is 40-70%. It is important, therefore, to remain alert to the possibility of SBP in patients with ascites.

Laboratory Diagnosis Evaluation for SBP consists of paracentesis with cell count and culture of the fluid. The sensitivity of ascites cultures is much higher (93% vs 43%) if ascites fluid is inoculated directly into blood culture bottles at the bedside, rather than being transported to a laboratory.⁴ An ascites fluid polymorphonuclear (PMN) leukocyte count ≥ 250 cells/mm³ correlates with infection,⁵ and such patients should be started on antibiotics pending culture results. Cefotaxime 2gm by vein every 6-12 hours has been studied the most extensively and is the initial treatment of choice for SBP. Ceftriaxone, amoxicillin/clavulanic acid, and fluoroquinolones are also effective. Five days of therapy are as effective as ten.

DR. JAKRIBETTUU: Her initial white blood cell count was 10,400/cm³, hemoglobin 11.9 g/dl, and platelets 100,000/cm³. Total serum protein was 6.7 g/dl, albumin 3.4 g/dl, bilirubin 1.8 g/dl. Serum alkaline phosphatase and transaminase were normal, but prothrombin time was slightly prolonged at 14.1 seconds. CT of the abdomen showed a nodular liver and abundant ascites. The ascites fluid had 6200 cells/cm³ (90% PMN leukocytes) and rare Gram-negative rods on staining. Total protein of the ascitic fluid was 4.2 gm/dl, albumin 2.3 gm/dl, glucose 81 mg/dl, bilirubin 1.0 mg/dl, amylase 37 IU/L, and lactate dehydrogenase LDH 124 IU/L.

Ampicillin/sulbactam (later changed to cefotaxime) was started for presumed SBP. The ascites fluid grew out *Bacteroides ceccae*, and the antibiotic was changed to imipenem. The patient continued to have abdominal pain and fever. Repeat paracentesis after 48 hours showed 5200 cells/cm³ (80% PMN leukocytes and 20% monocytes) in the ascitic fluid; culture grew *enterococcus* species.

DR. BRUGGEN: The laboratory evaluation suggests cirrhosis with impaired hepatic synthetic function, as indicated by the low albumin and the prolonged prothrombin time. CT confirmed the presence of ascites, and a liver appearance consistent with cirrhosis. Importantly, there was no localized inflammation, abscess,

or free intraperitoneal air. The SAAG was equivocal at 1.1 gm/dl, but the high number of ascitic PMN leukocytes suggests infection. Several features of the ascites analysis raise the possibility of secondary bacterial peritonitis, rather than SBP: the dramatically elevated leukocyte count, the high concentration of total protein, and the positive gram stain. The subsequent growth of anaerobic bacteria should raise the suspicion of a perforated viscus underlying the infection. Finally, the lack of prompt clinical response and the failure of the ascites PMN leukocyte count to improve significantly after 48 hours of antibiotic therapy is very suggestive of secondary bacterial peritonitis, rather than SBP. Further radiographic evaluation and surgical consultation are indicated for this patient.

Secondary or Spontaneous?

Secondary bacterial peritonitis occurs when ascites becomes infected as a result of a perforated viscus or perinephric abscess. Up to 15% of patients with infected ascites have a secondary peritonitis, and the distinction from SBP is very important because the standard intravenous antibiotic and conservative management used for SBP will invariably fail in the setting of a perforated viscus. In some patients the diagnosis of secondary bacterial peritonitis is straightforward because there is acute onset of severe abdominal pain and a rigid abdomen, or free intraperitoneal air is seen on upright abdominal films. In most patients with ascites, however, the clinical presentation is more subtle, and the distinction of secondary from spontaneous bacterial peritonitis can be difficult. Prospective studies have shown that ascites fluid total protein >1 gm/dl, glucose <50 mg/dl, or lactate dehydrogenase above upper limits of normal for serum is associated with secondary bacterial peritonitis.⁶ Observational studies have found that an ascites fluid leukocyte count above 5000 cells/mm³ and a positive ascites Gram stain are associated with secondary bacterial peritonitis. Cultures of ascites fluid that grow multiple organisms or anaerobic organisms (results found in <1% of cases of SBP) strongly suggest viscus perforation. Finally, when the ascites leukocyte count fails to improve after 48 hours of treatment an undetected perforation of a viscus should be suspected. Therefore, patients who fail to show significant clinical improvement after 48 hours on appropriate antibiotics should undergo repeat paracentesis and cell count. If secondary bacterial peritonitis is suspected, CT of the abdomen and upper and lower intestinal radiographic studies using water-soluble contrast should follow promptly. Surgical consultation should be obtained when appropriate.



Figure 1. Right lower quadrant collection of fluid and gas adjacent to redundant sigmoid colon, suggestive of diverticular abscess. Massive ascites is also evident.

Figure 2. Follow-up CT scan done 6 days later, demonstrating gas bubbles in pelvic ascites.

DR. JAKRIBETTUU: CT of the abdomen and pelvis showed moderate ascites and a separate, 4 X 7 cm collection of fluid and gas in the right lower quadrant, immediately adjacent to multiple diverticula in a redundant sigmoid colon (Figure 1). This appeared to be a diverticular abscess. Secondary bacterial peritonitis

resulting from the abscess, rather than SBP, was thought more likely. Because the patient was not a good surgical candidate, the abscess was drained percutaneously under CT guidance, and multiple antibiotics were continued. The hospital course was complicated by pneumonia and left pleural effusion.

A follow-up CT scan showed that the ascites fluid had become diffusely complex with pockets of gas (Figure 2), which was also drained under CT guidance. The patient subsequently demonstrated gradual clinical improvement, with resolution of abdominal pain and fever over the subsequent 2 weeks.

FINAL DIAGNOSIS: *Secondary bacterial peritonitis due to diverticular abscess in the setting of cirrhosis and ascites.*

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Obstetrician-Gynecologists as Primary Care Providers?

How North Carolina HMOs Decide

Jeanne-Marie Guise, MD, MPH, and Watson A. Bowes MD

Many women view their obstetrician-gynecologist as their only physician. For example, 54% of women aged 15-44 list their obstetrician-gynecologist as their primary care physician (PCP).¹ When the American College of Obstetricians and Gynecologists asked obstetrician-gynecologists whether they considered themselves primary care physicians or specialist-consultants, 48% said primary care and 48% said specialist-consultant.² Given this even distribution of response, it is perhaps not surprising that medical, governmental and public communities remain divided as to what primary care services obstetrician-gynecologists should provide. Ciotti³ found that 91% of obstetrician-gynecologists did provide primary care, but 74% felt their training was insufficient to the task. We undertook the present study to determine whether—and why—health maintenance organizations (HMOs) in North Carolina use obstetrician-gynecologists as primary care providers.

Methods

We defined primary care as

- first-contact,
- comprehensive (although possibly age- or gender-specific),
- continuous care, that provides for
- coordination of consultants, and includes
- screening and preventive care.

Drs. Guise and Bowes are in the Department of Ob-Gyn at UNC School of Medicine in Chapel Hill. Dr. Guise is also with the Oregon Health Sciences University in Portland, where she can be reached at the Department of Ob-Gyn, 3181 SW Sam Jackson Park Rd., Portland, OR 97201-3098. Email: guisej@ohsu.edu.

We arrived at this five-part description by assembling the common themes found in the definitions offered by the Institute of Medicine (IOM),⁴ the American College of Obstetricians and Gynecologists (ACOG),⁵ and the Council on Graduate Medical Education (COGME).⁶

Three factors influenced our decision to survey the specialty and primary care roles of obstetrician-gynecologists working in HMOs in North Carolina: (1) HMOs emphasize preventive and primary care; (2) HMO-employed physicians have less control over their designation or role than do doctors in private practice or working in physician provider organizations; and (3) HMOs are an increasing force in our medical economy (As of December 31, 1997, HMOs provided 17% of the health care in North Carolina, and women constituted 52% of the HMO population).⁷

We asked HMOs registered with the North Carolina State Department of Insurance whether or not they allow obstetrician-gynecologists to serve as PCPs and what factors affected their decisions. All 17 organizations were sent a letter stating the purpose of the study and asking them to designate a contact person. HMOs were asked to respond to the one mailing and up to three telephone contacts. Organizations were considered to allow obstetrician-gynecologists to serve as PCPs only if they (1) explicitly designated obstetrician-gynecologists as PCPs, and (2) did not require that an additional physician from another specialty also be designated PCP.

Results

All 17 North Carolina HMOs responded to preliminary questioning, and 14 completed the entire questionnaire. All 17 allowed women to have direct access to an obstetrician-gynecologist for specialty care, and eight of the 17 (47%)

Table. Factors Cited by 14 Health Maintenance Organizations In Choosing To Use Obstetrician-Gynecologists as Primary Care Physicians

| | 7 HMOs that DO use Ob-Gyn as PCP | 7 HMOs that DON'T use Ob-Gyn as PCP |
|------------------------------------|-------------------------------------|--|
| Preference of Ob-Gyns | 6/7 (86%) | 6/7 (86%) |
| Scope of PCP practice | 3/7 (43%) | 3/7 (43%) |
| HMO corporate philosophy | 2/7 (28%) | 4/7 (57%) |
| Patient referral pattern | 1/7 (14%) | 3/7 (43%) |
| Market forces/financial concerns | 2/7 (28%) | 1/7 (14%) |
| Uncertain about reasons | 1/7 (14%) | 1/7 (14%) |
| Ob-Gyn training | 0/7 | 2/7 (28%) |
| Problems with after-hours coverage | 1/7 (14%) | 0 |
| Ease of administration | 1/7 (14%) | 0 |

allowed obstetrician-gynecologists to serve as PCPs. Of the 14 HMOs (82% of the total) that completed the entire survey, there were 7 of 8 (87.5%) HMOs that allowed obstetrician-gynecologists to serve as PCPs and 7 of 9 (77%) HMOs that did not.

The 17 HMOs cover 939,683 lives (including both men and women). Organizations that allow obstetrician-gynecologists to serve as PCPs represent 386,846 (41%) of the covered lives, versus 552,837 (59%) for HMOs that do not. The top 5 HMOs serve 85% of the HMO population (795,821 covered lives), and three of them (covering 373,043 lives) include obstetrician-gynecologists on their lists of PCPs.

The Table shows the several potential reasons why HMOs might or might not allow obstetricians-gynecologists to serve as PCPs. The reasons most often cited by HMOs were

- obstetrician-gynecologist group practice preferences
- scope of clinical practice
- consistency with corporate philosophy.

Less frequently mentioned factors included

- concern about patient referral patterns
- financial concerns and market forces
- the extent of physician residency training.

Discussion

HMOs rely heavily on the preference of their obstetrician-gynecologist employees in deciding whether to allow them to function as PCPs. This reliance on practitioner preference was cited equally by HMOs that allowed obstetrician-gynecologists to serve as PCPs (6/7 or 86%) and those that did not (6/7 or 86%). This result was contrary to our early assumption that individual physicians would have little influence on decisions of an HMO.

The factor cited next most frequently (by 3 of 7 respondents in each group) related to the scope of practice of obstetrics-gynecology. HMOs that allowed obstetrician-gynecologists to serve as PCPs pointed out that obstetrician-gynecologists provide primary care services to pregnant women, and therefore should be able to provide similar services to non-pregnant women. Those organizations that chose not to allow obstetrician-gynecologists to serve as PCPs stated that the scope of obstetrical-gynecological practice is too narrow to equip obstetrician-gynecologists to function as full PCPs or gatekeepers. They cited as an example the inability to place a cast on a limb.

"HMOs rely heavily on the preference of their obstetrician-gynecologist employees in deciding whether to allow them to function as PCPs."

"Corporate philosophy" (both for and against using obstetrician-gynecologists as PCPs) was a factor in the decision by 2 of 7 HMOs that allowed obstetrician-gynecologists to serve as PCPs, and by 4 of 7 HMOs that did not.

Two organizations that allowed obstetrician-gynecologists to serve as PCPs mentioned that their decision was guided by community pressures (either pressure from competing medical systems or the preferences of their subscribers) and the attendant financial consequences of refusing to

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allow the obstetrician-gynecologists to serve as PCPs. Three organizations that did not allow obstetrician-gynecologists to serve cited their concern about the possibility of a high rate of referral to other physicians, or the fear of inordinate use of laboratory tests by obstetrician-gynecologists who might find themselves outside their usual scope of practice. These theoretical concerns were not based on factual experience.

In summary, our data show that many managed care organizations allow obstetrician-gynecologists to decide whether or not they want the responsibility of providing primary care, but we have few data on medical and financial outcomes of those decisions. It is clear that we need information about the medical and financial outcomes of patients followed by the different specialty practitioners who provide primary care. In addition, we need to document the preferences and behaviors of women regarding the issue of obstetrician-gynecologists as PCPs, and determine whether the number and proportion of women who do not use medical services is related to the availability of obstetrician-gynecologists serving as PCPs. □

Acknowledgment

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Primary Care Providers

The View from Where I Stand

A Commentary by the Editor

Hidden between the seemingly innocuous lines of the paper by Guise and Bowes is an astonishing fact. HMOs, in roughly equal numbers, either do or do not empower obstetrician-gynecologists (ob-gyns) to serve as primary care providers (PCPs) for their patients. What is astonishing is not this disunity in practice, but that the HMOs use the same arguments to support decisions both for and against. I take this to mean that HMOs have no idea about what a primary care doctor is. They appear to use a strictly utilitarian definition: a PCP is someone who does what the HMO thinks needs to be done. PCPs are doctors who set simple fractures, perform a number of procedures including simple surgery and flexible sigmoidoscopy, and are familiar enough with the general outlines of common disease that they can deflect the patient from referral to a specialist. In other words, PCPs is as PCPs does.

Now I happen to differ with this philosophy, common as it is. I have always thought that the PCP was defined by an *attitude*. The ability to perform procedures is an ancillary, but important, corollary of that attitude. What attitude do I mean? From my perspective of long years serving both as a primary care physician and as a specialist, I see it this way: The specialist encountering a patient asks, "Does this patient have the kind of disease I treat?" When the match of disease and doctor is good, the disease gets well treated, and often the patient as well. On the other hand, the PCP's question is, "How can I help this patient in trouble?" Disease as such is a secondary consideration; the goal is to be helpful. If that means specialist referral, fine—but recognize that the point at which the specialist can terminate the consultation ("I don't know why you are short of breath, Mrs. Jones, but your heart is fine.") is just the point at which the PCP's real work takes off. When the specialist's day is done, the PCP's is just beginning. This, I think, is the meaning of "ongoing, continuous" care.

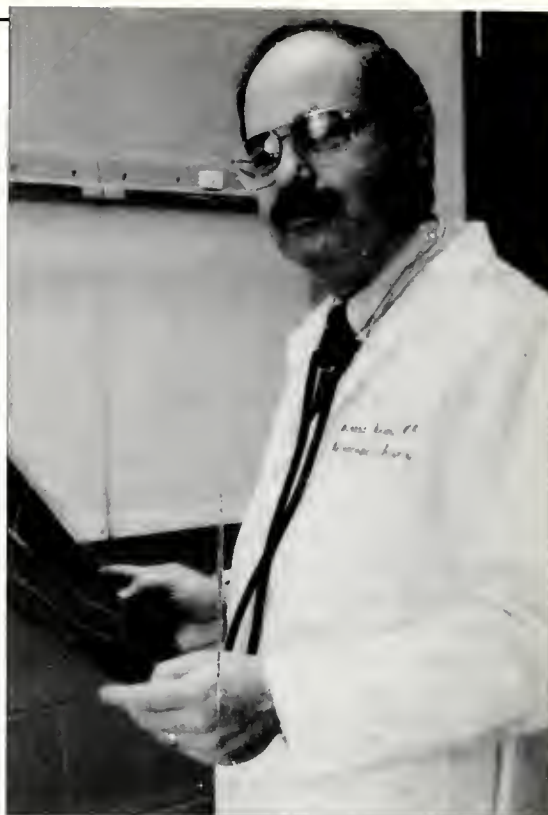
It is certainly true that the chief attributes of the "PCP attitude" would find favor with HMOs (and patients). In order to be helpful, PCPs would want to master a number of routine office procedures; they would want to learn how to probe deeply and skillfully into the social and psychological framework of the patient (since that is the origin of so many symptoms); they would use consultants sparingly but expertly because, whether or not "disease" is discovered in the consultation, the information will be helpful to the patient. Continuing education would become a priority, to ensure that the PCP is broadly conversant with a spectrum of medical and health problems. And the PCP attitude will cement the bond of trust that makes so many medical encounters profitable for patients.

I see no reason why ob-gyns should not have equal access to a PCP attitude. If they have it, I see no reason why they should not be first-rate primary care providers. Guise and Bowes call for more research into the outcomes of care delivered by PCPs with different training backgrounds. That may well provide some interesting data, but I don't think that the issue will turn on what school a doctor attended, or what residency program, or what procedures he or she has mastered, or how many patients can be seen in an hour. I think we will get an answer to the question of outcome of care only when we learn to assess the attitude of those who provide the care—to assess whether their goal is to find a way to help the patient.

—Francis A. Neelon, MD

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Carolina Physician's Bookshelf

W;it

by Margaret Edson

(New York, NY: Faber and Faber, 1999). 85pp.

Reviewed by William G. Porter, MD
Journal Associate Editor

W;it, the play by Margaret Edson that won this year's Pulitzer Prize, is one of the most powerful theatrical experiences I can remember. All physicians and medical students could benefit from seeing it, (it is still playing off-Broadway) or reading it, for it portrays with stunning accuracy and insight the way illness transforms every one of its victims, and how we might better recognize and respond to this transformation.

Edson, a young woman who now teaches kindergarten in Atlanta, once worked as a clerk on an oncology ward. *W;it*, her first and only play (the semi-colon in the title refers to the scholarly disputation about the correct punctuation of the last line of a John Donne sonnet), concerns Vivian Bearing, a fifty year old single woman with metastatic ovarian cancer, being treated with experimental chemotherapy by a senior oncologist and his research fellow, a young man who, as an undergraduate, took Bearing's demanding course on the metaphysical poets because he thought it would look good on his transcript. As he explains it to a nurse while doing a pelvic exam on Dr. Bearing: "Yeah. I survived Bearing's course... John Donne, those metaphysical poets, that metaphysical wit ...Like to see them try biochemistry."

That's the problem. Jason is more interested in Vivian's biochemistry, her intake and output, and in getting "full doses" of chemo into her than he is in her metaphysical wit, or the other defining features of her life. He took her course, but it did nothing to broaden the narrow path of pure science he has trod on his way to a career in cancer research. Ironically, until she became ill, Vivian's path was just as narrow: a scholarly preoccupation with the nuances of Donne's

Holy Sonnets, to the exclusion of what might be called a lived life, or, for that matter, any real warmth in her relationships with her students.

Poor Vivian. Her literary allusions are lost on her doctors and nurses, so she addresses them to the audience. As her suffering progresses (due both to her cancer and to the complications of chemotherapy), it is apparent that she needs another kind of defense. Understanding Donne's witty metaphysical poems about death is inadequate preparation for her own dying, a poor substitute for the empathic human contact that, without quite knowing it, she wants and needs. As she puts it in a speech to the audience:

"In everything I have done, I have been steadfast, resolute....Now I am distinguishing myself in illness... I think they [her doctors] foresee celebrity status for themselves upon the appearance of the journal article they will no doubt write about me.

"But I flatter myself. the article will not be about me, it will be about my ovaries....

"What we have come to think of as me is, in fact, just the specimen jar, just the dust jacket, just the white piece of paper that bears the little black marks."

And later, again to the audience: "I thought being extremely smart would take care of it. But I see that I have been found out."

Before Vivian dies, she finds what she needs, but not from her doctors, who never quite "get it". It comes instead from her nurse, Susie, who knows nothing about literature, but a lot about being human. And from one of her old college professors, another Donne scholar whose example launched Vivian's academic career. Now an old woman, the professor has learned from her grandchildren something about the universal human need for comfort and love.

With help from her nurse and her professor, Vivian is able to let go of her uncompromisingly intellectual defenses, and, in dying, to achieve an epiphany not unlike the one Donne refers to in his sonnet's oft-quoted last line:

Death be not proud; death thou shalt die.

Real Boys: Rescuing Our Sons from the Myths of Boyhood (New York, NY: Random House, 1998).

by William Pollack, PhD

Reviewed by Assad Meymandi, MD, PhD, LFAPA

Millions of words have been written about children's violence since the killings by school children in Arkansas. Most violent acts involving homicide have been committed by boys who are in deep emotional trouble. Unfortunately, society's beliefs and expectations have helped put them in that situation. Not all boys, of course, but many of them—too many, argue many psychiatrists and psychologists, including Harvard Medical School psychologist William Pollack—are in this fix.

Some of the latest thinking and research on the subject goes as follows: Society places boys in a "gender strait-jacket," judging their behavior with dated ideas about masculinity and what it takes for a boy to become a man. The biggest mistake adults make, Pollack, says, is pushing sons to separate from their mothers prematurely—as early as age five or six—and expecting them to be independent in school, at camp, in all sorts of situations they may not be ready to handle.

In early adolescence, boys get a "second shove" into new schools, sports competitions, jobs, and dating. The problem is not that we introduce our boys to the adult world, but how we do it. Pollack writes, "We expect them to step outside the family too abruptly, with too little preparation for what lies in store, too little emotional support, not enough opportunity to express their feelings and with no option of going back or changing course." The results have been evident for many years. There are the extreme public displays, such as the horrifying cases of school boys who go on killing sprees. And there's what Pollack calls the silent crisis of the "boys next door," the untold number of young males who are depressed, lonely, and unable to express the way they feel. "We create our own nightmares—unwittingly," Pollack asserts.

There is violence all around us, an influence he readily acknowledges. However, only the most disturbed boys would use it if our sons were raised in other ways, he says. Boys have as much need for nurturing, learning, and role-modeling as girls, but often they are denied their own needs for love, support, and dependence. Society has a "Boy Code" that defines what it means to be a boy, and it demands that young males suppress or hide their emotions. Adhering to the code hardens a boy until, ultimately, he loses touch with a spectrum of feelings.

When mothers and fathers push their sons to separate from them, it is not because they wish to harm their offspring, but because they believe it to be necessary. Perhaps that's not

right. "Hold onto them," Pollack implores in this volume. "You aren't going to make your boys into sissies and you aren't going to ostracize them." How you treat a boy has a powerful impact on who he becomes. Boys are as much a product of nurturing as they are of nature.

Twenty years of clinical and developmental research in child psychology by Pollack and his colleagues at Harvard Medical School show that a boy's behavior can be shaped, that any natural need for action can be encouraged and satisfied, and any impulse toward violence and aggression can be discouraged and channeled in creative, positive directions. Pollack, a founding member of the Society for the Psychological Study of Men and Masculinity of the American Psychological Association, insists, that violence in boys and male adolescents is directly related to lack of love and nurturing at an early age. Much of the book is derived from his recent study (*Listening to Boys' Voices*) in which his team of researchers studied hundreds of young and adolescent boys, testing and observing them in various situations, and talking with their parents. His work is a part of what has been dubbed an emerging boys' movement, spawned by researchers who are highlighting the difficulties of being a young male in North American culture.

How important are dads? A father's empathy and his involvement with his son during infancy and early childhood pay off all through a boy's life, and notably during the turbulent years of adolescence. When fathers are involved in their sons' lives, the boys are less aggressive, less overtly competitive, and better able to express feelings of vulnerability and sadness.

An 11-year study that followed boys from the age of seven to 22 showed that the more shared activities a boy had with his father, the more education he completed. The closer the emotional bond between the two, the lower the incidence of social delinquency. Unfortunately, some of the social programs passed by Congress in the past 30 years, while intended to assist, have had an adverse effect. These programs seem to have encouraged the birth of millions of children with absentee fathers—when society rewards delinquent behavior of teenagers by providing welfare payments, apartments, and food stamps if they produce children, the incidence of violence in these children increases meteorically. And it has.

Pollack's wise book repays reading by all of us, but especially those who care about—or for—parents and their sons.

Editor's Note: Dr. Meymandi submitted this review before the recent school shootings in Littleton, Colorado. That latest tragic incident of schoolboy violence gives even more urgent importance to the topic of Dr. Pollack's book.

*Life and Writings of Stewart R. Roberts, MD:
Georgia's First Heart Specialist*

by Charles Roberts, MD, Assistant Professor,
Department of Surgery, UNC-Chapel Hill
(Spartanburg, SC: The Reprint Company, 1993)

Reviewed by Edward C. Halperin, MD
Department of Radiation Oncology, Duke University,
and Journal Deputy Editor

Dr. Charles Roberts offers the reader a slim biographical volume concerning his grandfather, Stewart R. Roberts. The elder Dr. Roberts was born in Oxford, Georgia, educated at Emory College, the Southern Medical College, and the University of Chicago. He spent most of his career in the private practice of medicine in Atlanta, and on the clinical faculty at the Emory University School of Medicine. Roberts published a book on pellagra as well as a variety of articles on internal medicine, psychiatry, medical history, and ethics. He served as President of the American Medical Association and American Heart Association.

The principal failing of the book is one common to medical histories written by amateur medical historians: the failure to put the described story in larger context. For example, the author describes briefly the nature of the Southern Medical College of Atlanta, its location next to the Atlanta Medical College, its merger to form the Atlanta College of Physicians, and the subsequent development of these colleges into the school of medicine at Emory University. Nowhere do we hear about the changes in medicine before or after the Flexner Report, or the way medical education in Atlanta was affected by these larger scale changes in American medical education.

Another example of the relative lack of perspective is found in the discussion of pellagra. Although Stewart Roberts wrote a book on the subject, Charles Roberts does not put the present story in the larger context of the story of the isolation and identification of nicotinic acid, the pellagra-preventing factor, in 1938. Nor do we hear about the other major contributors to our modern understanding of pellagra, Joseph Goldberger and George Wheeler, who induced ex-

perimental pellagra in humans by means of diet. Roberts clearly had an interest in the disease, but he wasn't a major contributor to our understanding or treatment of it.

Another rather curious aspect of this book is its treatment of African-Americans. We have, without comment, a description of Drs. Roberts' upbringing in Oxford, Georgia, in which African-Americans are described as having furnished "plenty of cooks, butlers, nurse maids, stable and yard men, and wash women. Everyone who needed help or a job could find it. Neither the white master nor the mistress of the house ever held a hoe or a rake in their hands, and not even a nodding acquaintance with weeds or fallen leaves, for all yard work was done by a black man or boy. Black and white families have been bound together for generations, since before the civil war, something like the old clan and sept system in the highlands of Scotland. The Gaithers, for instance, always worked for the Stewarts, the Curringtons for the Branhams, the Wrights for the Stones. They were 'their families.' There was friendship and loyalty to each other. Black children were often named after the names of their white families." This is quite a bit of *Gone with the Wind* prose, as if one were yearning for days of yore with the happy white massa and his satisfied black workmen. One would be interested to read a black description of life in Oxford, Georgia, after the Civil War.

Later in the book we learned how Dr. Roberts was "evidently the first white physician in Atlanta to accept black patients at his clinic. They were seen during hours when white patients were absent from the waiting room." The author offers no comment on this vignette. I would have liked some description of the approach of other white physicians in Atlanta to the health care of blacks in the 1920s and '30s.

There is an interesting description of Dr. Roberts' recommendation of a young Eugene Stead for the position of Chairman of Internal Medicine at Stanford. He thought the young Stead might "grow into the full stature of [Purcell Roberts] . . . he may even exceed him."

This little volume will be of interest to those with a strong attachment to the School of Medicine at Emory University, those seeking some primary source material concerning medicine in Atlanta in the early part of the century, and those who are collectors of bits of Steadiana.

Does a High Level of HDL-C Cholesterol Undo the Bad Effects of a High LDL-C Cholesterol?

Amy L. Perris, BA; Alan G. Bartel, MD; Charles Maynard, PhD; Rebecca Bariciano, RN, CCRC; Kathy B. Gates; John R. Guyton, MD; Galen S. Wagner, MD

Serum lipoprotein concentrations are a critical element in the determination of coronary disease risk. High levels of total cholesterol and low-density lipoprotein cholesterol (LDL-C), and low levels of high-density lipoprotein cholesterol (HDL-C) increase the risk of coronary disease. According to the guidelines of the National Cholesterol Education Program, high LDL-C levels are the primary criterion for starting treatment; low HDL-C levels affect treatment decisions only via risk modification. High HDL-C levels appear to protect against coronary artery disease¹⁻⁶ in several ways, including the uptake of cholesterol from body tissues—a process known as reverse cholesterol transport.⁷⁻⁸

Despite the known benefits of high HDL-C levels and the known risks of a high LDL-C level, little attention has been paid to what should be done when patients have high levels of both HDL-C and LDL-C. To see whether the protective effect of one might counteract the negative effect of the other, we compared patients with elevated levels of both HDL-C and LDL-C to those with elevated levels of LDL-C but normal or low levels of HDL-C. We looked at demographic characteristics and the prevalence of cardiovascular disease in the two groups.

Methods

Patient population: We used the computerized databases at two large cardiac rehabilitation and lipid management clinics in Norfolk and Virginia Beach, VA, to identify patients ("study patients") with elevated fasting serum levels of both LDL-C (> 130 mg/dl) and HDL-C (> 55 mg/dl in men, > 65 mg/dl in women). Patients with serum triglyceride concentrations > 400 mg/dl were excluded. For each study patient, 2 matched control patients were selected from the databases. Control and study patients were matched according to gender, age (within 5 years), and LDL-C level (within 20 mg/dl), but, unlike study patients, control patients had HDL-C levels of < 55 in men and < 65 mg/dl in women. All identified patients were contacted by mail. The final population comprised 63 study respondents (with high HDL-C) and 148 control respondents (without elevated HDL-C).

Data collection: Demographic data were collected by mailed questionnaire, which included questions about heart failure, hypertension, and diabetes. Patients were asked to list all prescription and nonprescription medications currently being used. A positive family history of coronary disease was indicated by any positive response to questions about angina, heart attack, sudden death, balloon angioplasty, and coronary bypass surgery in parents, siblings, or children. Patients were questioned about their present height and weight, use of low-fat diets, tobacco products and alcohol. Patients were asked to assess their level of physical activity as none, light, moderate or high (moderate physical activity was defined as that producing dyspnea and occurring in at least two 20-minute sessions per week; high physical activity was defined

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Table 1. Baseline Characteristics of High HDL-C and Control Patients

| Variable Demographic | Study (n=63) | Control (n=148) | p |
|-----------------------|--------------|-----------------|-------|
| Women | 44.4% | 37.8% | 0.37 |
| Caucasian | 88.7% | 95.2% | 0.08 |
| College Graduate | 33.3% | 23.2% | 0.13 |
| Married | 71.4% | 83.0% | |
| Widowed | 22.2% | 10.2% | |
| Age | 64.5±9.1 | 64.4±9.1 | 0.97 |
| Weight (pounds) | 168±35 | 173±32 | 0.36 |
| Height (inches) | 66.5±4.0 | 66.9±3.9 | 0.56 |
| Heart Failure | 1.6% | 8.1% | 0.07 |
| Hypertension | 34.9% | 42.6% | 0.30 |
| Diabetes | 6.3% | 12.2% | 0.21 |
| Lipid Medication | 60.3% | 8.9% | 0.23 |
| Family History of CAD | 69.8% | 85.1% | 0.01 |
| Past Smoking | 58.7% | 37.8% | 0.57 |
| Current Smoking | 4.8% | 8.1% | 0.39 |
| Drinking | 58.7% | 37.8% | 0.005 |
| Physical Activity | | | 0.56 |
| None | 37.7% | 30.1% | |
| Light | 13.1% | 10.5% | |
| Moderate | 9.8% | 14.7% | |
| High | 39.3% | 44.8% | |
| Low-Fat Diet | 69.8% | 70.9% | 0.87 |

and 95% confidence intervals from these analyses.

Results

The combination of high HDL-C and high LDL-C was found in 6.3% of all patients enrolled in the databases in our coronary disease prevention and rehabilitation programs. Study and control patients were predominantly white (only 5% were African-American), and most were men (Table 1). The two groups were similar with respect to baseline characteristics, although there were slightly more women in the study group. There were two striking differences: a lower proportion of patients in the study group had a family history of coronary artery disease ($p=0.01$), and a higher proportion patients in the study group currently drank alcohol ($p=0.005$) (Table 2).

Table 1 shows that use of medication to alter lipid levels was slightly, but not significantly, higher in the control group. Medications known to raise HDL-

as aerobic exercise sufficient to produce tachycardia and diaphoresis in at least three 30-minute sessions per week). Serum lipid concentrations from patients' most recent clinical visits were obtained from the databases.

Endpoints: We used the databases to determine whether patients experienced any of the following cardiovascular events: myocardial infarction, angina, stroke or transient cerebral ischemic attack, carotid artery surgery, peripheral vascular disease, percutaneous transluminal coronary angioplasty (PTCA), or coronary artery bypass surgery (CABG). We combined PTCA or CABG into an endpoint called "myocardial revascularization," and a composite endpoint (myocardial revascularization or the occurrence of angina pectoris or myocardial infarction).

Statistical methods: Chi-square and Student *t* statistics were used to determine whether study and control groups differed with respect to baseline characteristics, number of alcoholic drinks consumed per week, lipid measurements, and cardiac events. Stepwise logistic regression was used to determine whether study patients were less likely to experience cardiac events. All statistically significant predictors of cardiac events were allowed to enter the model; at the final stage, a variable indicating whether the subject was a study or control patient was forced into the model. We report the resulting odds ratios

C levels were evaluated separately: Gemfibrozil was used by 17.5% of the study group and 18.2% of the control group ($p=0.89$). Niacin was used by 6.7% of the study group and 18.2% of the control group ($p=0.03$), probably reflecting a perceived lack of need for niacin in patients with high HDL-C.

Table 3 summarizes lipid level measurements in the two populations. By design of the study, HDL-C levels were vastly different in the two groups. The overlap of HDL-C levels in the two populations was due to the fact that HDL-C selection criteria differed according to gender. The average total cholesterol level was higher in the study group, and triglycerides were higher in the control population. There was no statistically significant difference in LDL-C levels in the two groups.

Table 4 shows that there were distinct differences in the frequency of coronary artery bypass surgery and revascularization between the groups; there were also dramatically different rates of occurrence of the composite endpoint of all coronary ischemic events or revascularization. The differences in occurrence of angina and myocardial infarction were of only marginal statistical significance, and the rate of occurrence of noncardiac events such as stroke, carotid surgery, or peripheral vascular disease did not differ in the two groups.

Unadjusted odds ratios as well as odds ratios adjusted by

multivariate logistic regression are shown in Table 5. Patients in the control group were half as likely as those in the study group to have either angina pectoris or myocardial infarction, although the 95% confidence interval includes 1.0, so this finding did not achieve statistical significance. The results favoring the study group are most evident for revascularization and the composite endpoint. After adjusting for use of lipid medication, triglycerides, gender, education, and family history of coronary artery disease, the odds of a study patient having one or more of the events which make up the composite endpoint were one-third (0.34) those of patients in the control group.

Discussion

A multitude of prospective epidemiological studies has docu-

mented the inverse relationship between HDL-C and cardiovascular disease.^{6,8-10} Many studies have investigated the effects of low-density lipoproteins on cardiovascular disease,¹⁰ but few have examined the interplay between the independent risk factors of HDL- and LDL-C. Population-based data from the Framingham Study^{5,11} cannot be simply translated into the cardiology practice setting. The present study examined the interactive nature of HDL-C and LDL-C in the setting of cardiac rehabilitation and lipid clinic practice.

Practitioners in cardiac rehabilitation and prevention clinics sometimes express the opinion that high HDL-C levels do not protect against atherogenesis in patients with high LDL-C cholesterol levels, but there is only anecdotal evidence for this. In fact, the population-based Framingham Study found that a 30 mg/dl increment in HDL-C cholesterol

Table 2. Mean Number of Alcoholic Drinks Per Week

| Type of Drink | Study (n=63) | Total Population Control (n=148) | p | Study (n=37) | Drinkers Only Control (n=56) | p |
|---------------|--------------|-------------------------------------|---------|--------------|---------------------------------|--------|
| Wine | 1.1±2.9 | 0.9±2.7 | 0.81 | 1.9±3.7 | 2.5±4.0 | 0.23 |
| Beer | 1.8±5.2 | 0.5±2.3 | <0.0001 | 3.0±6.5 | 1.3±3.6 | <0.003 |
| Hard Liquor | 2.8±5.9 | 1.2±3.5 | <0.0001 | 4.8±7.1 | 3.2±5.1 | <0.038 |

Table 3. Lipid Profiles

| Measurement (mg/dl) | Study (n=63) | Control (n=148) | p |
|---------------------|--------------|-----------------|---------|
| Total Cholesterol | 251±33 | 230±29 | <0.0001 |
| HDL-C | 68±9 | 42±10 | <0.0001 |
| LDL-C | 164±28 | 156±25 | 0.06 |
| Triglyceride | 122±64 | 158±74 | 0.001 |

Table 4. Atherosclerotic Events

| Variable | Study (n=63) | Control (n=148) | p |
|-----------------------------|--------------|-----------------|--------|
| Angina | 42.9% | 58.1% | 0.042 |
| Myocardial Infarction | 30.2% | 44.6% | 0.05 |
| Stroke/ TIA | 6.3% | 6.1% | 0.94 |
| Carotid Surgery | 1.6% | 5.4% | 0.21 |
| Peripheral Vascular Disease | 0.0% | 4.7% | 0.08 |
| PTCA | 20.6% | 27.7% | 0.28 |
| CABG | 30.2% | 50.7% | 0.006 |
| Revascularization* | 44.4% | 65.5% | 0.004 |
| Cardiac Composite† | 65.1% | 89.9% | <0.001 |

* Revascularization is a variable comprising percutaneous transluminal coronary angioplasty (PTCA) and coronary artery bypass grafting (CABG).

† The cardiac composite consists of the revascularization processes of PTCA and CABG as well as myocardial infarction and angina

Table 5. Odds of Atherosclerotic Events for Patients with High LDL-C and High HDL-C compared to High LDL-C and low-normal HDL-C

| Event | Unadjusted Odds Ratio | 95% Confidence Interval | Adjusted Odds Ratio | 95% Confidence Interval |
|---|-----------------------|-------------------------|---------------------|-------------------------|
| Myocardial Infarction | 0.54 | 0.29-1.00 | 0.66 | 0.34-1.28* |
| Revascularization | 0.42 | 0.23-0.77 | 0.49 | 0.26-0.93† |
| Angina | 0.54 | 0.30-0.98 | 0.71 | 0.36-1.39‡ |
| Composite (Angina, Myocardial Infarction, or Revascularization) | 0.21 | 0.10-0.43 | 0.34 | 0.14-0.79§ |

* Adjusted for history of hypertension and current drinking

† Adjusted for gender and use of cholesterol medication

‡ Adjusted for low-fat diet, history of hypertension, use of lipid medication, current smoking and triglycerides

§ Adjusted for lipid medication, triglycerides, gender, education, and family history of coronary artery disease.

reduced the risk of coronary heart disease by a factor of 3, regardless of whether LDL-C cholesterol was 100, 160, or 220 mg/dl.¹¹ The analyses shown in Tables 4 and 5 should help to resolve the apparent discrepancy. Only 65% of patients with the combination of high HDL-C and high LDL-C had a coronary event (PTCA, CABG, myocardial infarction, or angina), compared to 90% of patients with high LDL-C but normal or low HDL-C. Selective perception best explains the opinion of practitioners who say that high HDL-C does not protect against the deleterious effect of high LDL-C. The odds ratio, which is calculated not merely from the fractions of subjects with disease but also from the fractions without disease, can overcome some of the effects of selection bias. We found an adjusted odds ratio of 0.34 (Table 5) and a difference in average HDL-C between groups of 26 mg/dl (Table 3). This result is remarkably similar to the protective effect of HDL-C despite LDL-C such as was found in Framingham.

It is necessary to consider the factors that may have influenced the HDL-C levels of the study population. A significantly larger number of patients in the study group regularly consumed alcohol, and moderate consumption of alcohol increases HDL-C levels.¹² Patients in the control group were slightly more physically active than those in the study group although the difference was not statistically significant. This tendency is contrary to the usual association between higher levels of HDL-C and physical activity,¹³⁻¹⁴ and may reflect an emphasis on prescribing exercise for patients with low HDL-C.

Study limitations: The present study is limited by the fact that our population consists mainly of white men and women.

It is also limited by the fact that only one set of lipid measurements was evaluated for each patient, and these levels can vary from day to day within patients.¹⁵⁻¹⁶ Our results are possibly skewed by the fact that the patients were already enrolled in programs to control lipid levels, and many of them were taking various medications designed to affect lipid levels. Therefore, our patients are not representative of the general population but rather of patients encountered in cardiology and lipid practice. □

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Running the Numbers

*A Periodic Report to North Carolina Physicians and Their Patients
About Current Topics in Health Statistics*

Paul A. Buescher, PhD, Editor

Death Certificates

Information from death certificates is crucial for profiling the health of North Carolinians. With the exception of new cancer cases, some communicable diseases, and a few special surveys, there is no systematic reporting of persons who are living with various illnesses. Therefore we must rely primarily on death certificates to identify the major health problems facing the citizens in our state. Especially important for this purpose is the portion of the death certificate completed by physicians, certifying the causes of death. According to information reported there, the following were the leading causes of death among North Carolina residents in 1997:

| Disease | Number of deaths |
|-------------------------------------|-------------------------|
| Diseases of the heart | 19,265 |
| Cancer | 15,150 |
| Cerebrovascular disease (stroke) | 5,220 |
| Chronic obstructive lung disease | 3,195 |
| Unintentional injuries | 3,011 |
| Pneumonia and influenza | 2,457 |
| Diabetes | 1,833 |
| Suicide | 901 |
| Other diseases of arteries | 814 |
| Nephritis (kidney diseases) | 688 |
| Homicide | 671 |
| Chronic liver disease and cirrhosis | 663 |
| Septicemia | 655 |

The leading causes of death vary substantially by age, race, sex, and geographic area of the state. The recording on death certificates of these and other demographic factors permits comparisons of mortality among different population groups.

The ranking of disease categories in the table above is based on reported primary or "underlying" cause of death. However, all conditions contributing to death should be recorded on the death certificate by physicians. This information allows a portrayal of multiple causes of death. Such analysis reveals that, for example, diabetes is mentioned as a contributing cause of death approximately four times as often as it is determined to be the underlying cause of death.

*From the State Center for Health Statistics
www.schs.state.nc.us/SCHS
North Carolina Department of Health and Human Services*

North Carolina Childhood Asthma Management Initiative

A Summary of the Summary Report

Stanley I. Music, MD, DTPH, and William Furney

Editor's note: In one of his first official acts as State Health Director, Dr. A. Dennis McBride called for a group of medical, educational, and public health professionals to assess the growing health problem of asthma in North Carolina's children. In June 1998, the 36-member North Carolina Childhood Asthma Management Initiative was created and charged with developing a comprehensive approach to the diagnosis and management of asthma in children. In October, this task force presented a report, whose findings and recommendations are summarized here. The full 17-page report is available upon request from Dr. Jerry Wiley in the Children and Youth Branch of the Women's and Children's Section, Division of Public Health, NCDHHS. He can be reached at 919-715-3809 (voice), 919-715-3187 (fax) or online at <jerry.wiley@ncmail.net>.

Asthma is an increasingly serious health problem for children, but accurate assessment of its prevalence and resultant morbidity has proved difficult because there is no consensus about diagnostic criteria. Despite this shortcoming, there is a large body of research aimed at better understanding of the disease and its multiple, pervasive impacts. A review of this research provides substantial, albeit equivocal, insight into the scope of the problem.

In 1993 approximately 13.7 million Americans had been told they have asthma, a 75% increase in prevalence from 1980.¹ It is estimated that up to 7% of US children have asthma, making it the most common chronic disease of childhood.²⁻⁴ Recent estimates indicate that some 273,000 North Carolinians—including 122,000 under 18 years of age—have asthma,⁵ with African-American and poor children disproportionately affected.^{1,2,4,6} In North Carolina, hospital discharge rates related to asthma are nearly three times

higher for minorities than for white children,⁷ and they are highest in the state's non-urban (mountain and coastal plain) counties.⁷

Beyond the obvious health consequences, childhood asthma in North Carolina exacts a terrible financial toll. School health nurses reported in 1997 that asthma was the second most common chronic illness among school children. Asthma accounts for approximately 17% of all emergency department visits by children,⁸ and leads to 263.7 hospitalizations per 100,000 children each year—well above the Year 2000 Health Objective of 225.⁷ Annual health care costs for children with asthma are estimated to be about \$1,000 per child and \$3,000 per hospitalized child.^{9,10} Asthma mortality may be rare, but the personal and financial consequences of this disease are quite significant.

There is little doubt that we could improve the quality of life for children with asthma if we were better able to recognize and treat the disorder. Society would benefit from the money saved by decreased emergency department visits, hospitalizations, and other expenses related to asthma. To accomplish these goals, we need local, community-based programs to reach the large number of children with asthma and to address their problems.

Stanley I. Music, MD, DTPH (Lond.), is a medical epidemiologist; he was formerly with the Childhood Asthma Initiative, Division of Public Health, NC Dept. of Health and Human Services. William Furney is Director of Public Health Information for the NC Dept. of Health and Human Services.

Addressing Childhood Asthma in North Carolina

It was the consensus of the North Carolina Childhood Asthma Management Initiative that the best way to reduce the impact of asthma on children's health in North Carolina would be to coordinate existing resources for better response at a local level. A network of local, community-based coalitions across the state would accomplish several objectives:

- assure that children with asthma receive early and accurate diagnosis and continuing treatment in accordance with national standards;
- help reduce or eliminate environmental asthma triggers from homes, schools and other public spaces;
- increase awareness about the disease and promote individual and community actions to reduce its harmful effects on children;
- improve data collection, leading to better documentation of the personal and financial impact of the disease and the effectiveness of local interventions.

Comprehensive asthma management programs have already been established in some North Carolina localities. We need to expand the concept statewide, allowing each local asthma coalition to vary its focus based on the local situation and priorities, the interests of its members, and the resources available. The state's role would be to ensure the availability of services needed to support the development and maintenance

of local coalitions. The Department of Health and Human Services (DHHS) can provide technical assistance to localities interested in beginning a program. The state can also offer or sponsor training sessions on coalition building for interested localities. The state would be responsible for monitoring local initiatives and evaluating their outcomes. DHHS could coordinate asthma-related activities among state agencies and serve as an information clearing-house for local initiatives.

Data Collection

The systematic collection of information about each child would strengthen and complement statewide efforts to understand asthma prevalence and its impact on communities and individuals. Each local initiative would be responsible for collecting outcome data to evaluate the program's effectiveness. Local programs would be able to assess asthma-related deaths, emergency department visits, hospitalizations, medication abuse, health care costs, repeat acute exacerbations, insurance status, and school absences. By collecting and reporting data on asthma morbidity and mortality at state and local levels, the state could develop a standard data set and a uniform statewide standard for asthma-related coding on hospital and insurance records.

Table. Summary of Statewide Asthma Education Activities

| Purpose | Activity | Sponsor |
|---|---|---|
| Increase general public awareness of asthma | Attack Asthma Campaign will use video news releases and press conferences, news and journal articles, brochures and other printed materials, as well as an Internet website. Governor proclaims October 1998 as Asthma Month. | American Lung Association of North Carolina (ALANC) |
| Educate child care providers about asthma management issues | Asthma Preschool Educational Initiative will develop and distribute educational materials and train child care health consultants. (Initiative begun in August 1998.) | Healthy Child Care North Carolina Campaign |
| Provide asthma-related health education to elementary school children with asthma | Introduction and use of the American Lung Association Open Airways Curriculum for Schools curriculum in all elementary schools in the state. | American Lung Association of North Carolina (ALANC) |
| Reduce exposure to second-hand cigarette smoke | The state's 10 local Project ASSIST coalitions (covering 23 counties) are doing on-going work in this area. The Lung Association, Cancer Society, and others support educational activities statewide. | Project ASSIST (Division of Community Health) |

Public Awareness and Education

The task force identified as key the need to raise public awareness of asthma's major contributing factors and of resources for treating the disease. Rectifying the faulty information that surrounds the management and control of childhood asthma will require education of several target groups, including primary and preventive health care providers and staff, local public health agencies, asthmatic children and their families, child care providers and school personnel, and the general public. Because several statewide campaigns related to public awareness of asthma are already planned or in existence (see Table), the Task Force did not recommend undertaking any additional public awareness efforts at this time.

Improved Medical Management

The task force considered that state and local health care facilities are responsible for assuring that their personnel adhere to standards in diagnosing and treating asthma in children. The accepted standards of care are available from the National Institutes of Health (NIH) [Online at www.nhlbi.nih.gov/nhlbi/lung/asthma/prof/asthgdln.htm] or the American College of Allergy, Asthma and Immunology [Online at <http://allergy.mcg.edu/physicians/manual/manual.html>]. Information about these standards and their implementation should be available to those who provide preventive, primary, curative, and emergency medical services to children with asthma—such as pulmonologists, allergists, pediatricians, family practitioners, and emergency medicine physicians, physician assistants, nurses, pharmacists, respiratory therapists, nurse practitioners, and office staff.

Local coalitions could help assure that providers participate in education and training session as appropriate. The task force recommended that coalitions facilitate participation in existing training, develop local training opportunities where necessary, and reinforce compliance within the community. A large number of possible training methods are available. They include formal CME programs to review NIH guidelines (to include hands-on learning), as well as one-on-one consultations where asthma specialists present current infor-

mation and assess individual or clinical practice protocols. Practices could have their medical staff (physicians, nurses, etc.) spend a day or a week with appropriate asthma specialists. Regional asthma education centers could be established to serve as educational resources for patients and providers. Each local initiative would have to choose the formats most appropriate for its program, with the prerogative of tailoring them to specific local needs.

The North Carolina Medical Society, in conjunction with the Division of Medical Assistance, has already established a comprehensive educational program, offered through AHEC training facilities, for primary care providers who participate in *Carolina Access* and *Health Choice*. Glaxo Wellcome will provide funding for five asthma training sessions in rural areas. .

"The North Carolina Medical Society, in conjunction with the Division of Medical Assistance, has already established a comprehensive educational program, offered through AHEC training facilities, for primary care providers who participate in *Carolina Access* and *Health Choice*. "

Environmental Interventions

In addition to treatment, steps must be taken to control the environmental triggers that induce asthma attacks. The state Division of Epidemiology and the Division of Environmental Health are currently engaged in a variety of activities that, when implemented at the local level, will improve living environments for children with asthma and all citizens. The environmental health specialist will become a key participant in the planning and implementation of local initiatives. Both divisions will intensify efforts to obtain state and federal support for a number of projects, including the development of educational materials for health care

providers, social services providers, school nurses, and building inspectors. Educational materials will also be made available for distribution to the families of children with asthma. In addition, we may well see programs that make local environmental health specialists available for in-home assessment of asthma triggers for families referred by health and social services providers.

Efforts are under consideration to modify existing local environmental health regulatory programs and to place more weight on violations that worsen indoor air quality and allergens (asthma triggers). Such efforts would allow local environmental health specialists to pay increased attention to asthma triggers as they conduct sanitation inspections of childcare facilities, etc. In a similar way, environmental

health specialists could integrate asthma control into existing residential and institutional inspections. It may be possible to expand and enhance the childhood lead poisoning prevention "mini-grant" program to include interventions related to asthma.

The task force did recommend that local coalitions contribute to community-based efforts to reduce exposure to tobacco smoke. This could be accomplished by encouraging local schools to support the Department of Public Instruction's request to eliminate smoking entirely in all North Carolina schools and grounds. Collaborating with local Project ASSIST coalitions to promote smoke-free schools, work places, and public areas is another arena for activism. It was also recommended that a local clinician be recruited to attend the North Carolina Medical Society Tobacco Policy Conference, to educate physicians about helping patients quit smoking. This would be a step toward a tobacco-free home and community environment.

Starting Local Initiatives

Success of the proposed North Carolina Statewide Asthma Initiative depends upon creation of community-based initiatives to bring community members together, so that they can address asthma management and control. This summary has outlined the recommended components for local, community-based initiatives. Communities interested in establishing such a local coalition may find the following guideline to be useful:

Step 1: Schedule an initial meeting to gauge the interest of community members who are likely already to be involved in asthma management, or to have an interest in improving asthma management in the community. This initial meeting should include

- ◆ community-based primary or specialty care providers, including pediatricians, family practitioners, allergists, pharmacists, nurses, respiratory therapists, and health educators;
- ◆ hospital-based health care providers including physicians, nurses, respiratory therapists, emergency department staff, administrators, health educators, and others;
- ◆ school health nurses and regional school health consultants;
- ◆ advocacy groups and parents of children with asthma;
- ◆ representatives from the regional American Lung Association (ALANC) office;
- ◆ local health department representatives including administrative, clinical and environmental health staff members;
- ◆ public and private family service agencies;
- ◆ others as appropriate for each community.

Step 2: Review current asthma-related activities of each participating individual or group.

Step 3: Identify gaps in services based on local perceptions and the recommendations contained in this report.

Step 4: Determine what further action is needed and develop an action plan.

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The Elimination of Preventable Asthma

Lessons from Smallpox

Stanley I. Music, MD, DTPH (Lond.)

Confrontation was not the only mode of capitalist-communist interaction during the long cold war that ended with the Soviet Union's collapse. Although rarely, they did at times collaborate, as when the US strongly supported a 1967 Soviet proposal to commit the World Health Organization (WHO) to the global eradication of smallpox. At the time, smallpox was rampant in Brazil, India, Nepal, Afghanistan, East Pakistan (soon to be reborn as Bangladesh), West Pakistan, Indonesia, Yemen, and some 15 African countries—together comprising about a third of the world's population. Under joint Soviet-US leadership, a massive effort began, using active surveillance to guide vaccination. Ten years later, on October 26, 1977, Ali Maow Maalin, a 23-year-old cook from Merka, Somalia, fell ill with smallpox. While infectious but still undiagnosed, he had contact with more than 160 people. Using active surveillance, each was tracked down. Most had already been vaccinated against smallpox, but the 33 who had face-to-face exposure with no previous vaccination were vaccinated and placed under surveillance for the two-week incubation period. None developed smallpox.

Mr. Maalin was and still is the last recorded case of smallpox in a chain of transmission, going back well over 3000 years, which has helped shaped world history. The absence of new cases makes it clear that we have eradicated smallpox. As they surely said at the time, in Somali-accented Arabic, *Al Hamdul Illah!*—by the Grace of God!—we can expect to reap the benefits of this truly remarkable achievement, recurrently, forever.

The eradication of smallpox was achieved using technology that had already been invented; nothing new was required. By 1967, those countries with sufficient organization and resources for routine and effective vaccination of their citizens had already interrupted the spread of smallpox. They could actively track down all imported cases to prevent the re-establishment of indigenous transmission, and this was enough to make them smallpox-free. In other infected countries without this ability, however, transmission was intense, with literally millions of new cases each year (2.5 million in 1967 alone). And few of their children were immunized against anything, let alone smallpox.

WHO used active surveillance to guide the application of freeze-dried vaccine (with jet injectors and bifurcated needles) in a program for the global eradication of smallpox that was destined to put the program itself out of a job. To block transmission, vaccination was carried out in a ring in and around any villages that were infected at any one time. Active surveillance assured vaccination in a timely fashion so that transmission was interrupted.

Relevance to Asthma

I believe that the lessons we learned from smallpox are applicable, by analogy, to asthma. We have the technology, in the form of accurate, affordable and portable peak-flow meters to assess airway obstruction; powerful new drugs for maintenance and rescue of asthmatic airway obstruction; and effective ways to reduce exposure to important environmental triggers of asthma. But, just as with smallpox, technology alone is not enough. While we cannot truly eradicate asthma, of course, I would guess as much as 80% might be prevented by the shrewd use of active surveillance to guide and manage our currently fragmented, unorganized prevention efforts.

Throughout North Carolina and the entire country, local coalitions are being formed in a massive grass-roots effort at secondary prevention of asthma. We don't yet know enough to undertake primary prevention, but we certainly do have the potential to identify asthmatic children, and to train them and all the people with whom they interact to become and remain confidently symptom-free (secondary prevention). In plain English, I can envision the day

- ◆ when no child with asthma goes undiagnosed, untreated, or ineffectively treated;
- ◆ when the intelligent use of peak flow meters and care plans prevents virtually all asthma emergencies;
- ◆ when all environmental asthma triggers are promptly identified and then either minimized or eliminated entirely so that no asthmatic child remains exposed to such triggers;
- ◆ when asthmatic children are empowered to live normal lives, to attend school regularly, and to exercise normally.

Asthmatic children who continue to suffer repeat acute asthma attacks despite full application of secondary prevention will be easily identified—the “noise” that currently hides them will be gone! They will become the focus of further research to overcome the shortfalls in our present knowledge.

But the potential for asthma prevention remains largely unrealized. Far too many asthmatics remain undiagnosed or ineffectively treated. Far too few peak flow meters are used regularly and skillfully. Too many environmental triggers remain unattended. Too much school is missed, too many parents lose work time, and too many asthmatic attacks are unnecessarily recurrent. Too many doctors' offices are not up to date in the treatment of childhood asthma. And, even when we know what to do and how to do it, economic pressures from managed care, short-changed patient education, and the eroding doctor-patient relationship result in significant non-compliance. In short, asthma today looks a lot like smallpox in 1967. Too many communities, as my Bengali smallpox surveillance crew would say, “are not doing the needful.”

If it were simply a matter of distributing treatment guidelines, exhorting communities to form coalitions, or inspecting schools for the presence of asthma triggers, then we could rest easy because the elimination of preventable asthma would already be under way. But we cannot because it is not. This is smallpox redux. There is a window of opportunity that we must exploit while it is open.

The Asthma Problem in a Nutshell

If local asthma coalitions are to have the power and wherewithal that will give them a realistic opportunity for success, they must have the information that is success's prerequisite. This includes, but is not limited to,

- ♦ an assessment of how much “preventability” can be ascribed to each of the many possible interventions;
- ♦ the cost-efficiency and cost-effectiveness of each possible intervention;
- ♦ ongoing, yearly updates of prevalence and incidence of asthma by age, sex, race, urban versus rural domicile, by county;
- ♦ the rate of repeat asthma emergency visits, by county.

All of this information can be provided by active surveillance, a capacity being developed and field-tested in North Carolina along with a parallel capacity for epidemiologic analysis.

Applying ISAAC as a Tool for Active Surveillance

There are some pitfalls, however. Asthma is not a reportable disease. There are no established standards for the routine practice of primary care medicine. Epidemiologists have

long been frustrated by the resultant impossibility of making comparisons across communities. A few years ago, a group of creative New Zealanders began to forge a solution. They produced a very short video that showed (in 10-second clips, one at a time) young people experiencing various forms of acute asthma attacks: becoming wheezy during exercise (running), waking from sleep with coughing and wheezing, etc. Because the video overcame definitional and labeling difficulties—such as finding the Maori word for “wheeze”—they were able to use it in a very clever survey of children. After watching a few seconds of the video, the children were asked questions like, “Has this ever happened to you? If Yes, then how many times in the last month?”

Out of this deceptively simple idea grew *ISAAC*, or the International Study of Asthma and Allergies in Childhood. *The Lancet* for April 25, 1998 published findings from the first valid, internationally comparable asthma research, involving almost half a million 13- and 14-year-old children from 56 countries, many of whom saw the video clips. Here, for the first time, was convincing evidence of a global epidemic of asthma. Some of the surveyed sites showing asthma prevalence in excess of 30%! This brief explication has not done justice to *ISAAC*, but it is a bona fide research tool and could become the core surveillance tool to guide and manage North Carolina's asthma prevention efforts.

A Modest Proposal

An anonymous survey that incorporates the *ISAAC* video clips of young persons experiencing asthma episodes is currently being field-tested. The survey is entirely self-contained and requires 38 minutes to administer. If it proves practical and can be done statewide at minimal cost, then I would recommend that health authorities and school authorities put their heads together and arrange for one class period in each school each year to be devoted to a suitably configured asthma survey. The yearly information gleaned by active surveillance would provide the basic data that, properly analyzed, would inform and guide the management of the state's asthma prevention efforts.

We can't stop people from getting asthma, at least not yet. But we can work with physicians, nonphysician health-care providers, and all the relevant “others” in our children's lives to eliminate preventable asthma. “Where there's a will, there's a way.” If we can summon the will, preventable asthma can be made to virtually disappear. And because we can do it, this physician for one believes we must do it. □

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Prepare papers according to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (N Engl J Med 1991;324:424-8) with the following exceptions: 1) no abstract is needed; 2) no running title is needed; and 3) report measurements in metric units; use of the International System of Units (SI) is optional.

Submit a cover letter and a 3 1/2-inch computer disk that contains the text written in MS DOS- or Macintosh-compatible format. Also enclose three hard copies of the text for review purposes. Double space text with one-inch margins. Please do not "format" the text (e.g. no variations in type size, no bold face, no italics, no embedded endnotes).

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Submit tables, charts, and graphs as hard copy and include copies on disk, in their original format and translated as TIFF, PICT, or EPS documents. Type all figure legends separately. Type and double-space all tables, one to a single sheet of paper. Tables must have titles and consecutive Arabic numbers.

Keep references to a minimum (preferably no more than

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Photograph by Swati Agarwal, a third-year medical student at Duke.

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P o e t r y i n M e d i c i n e M e d i c i n e i n P o e t r y

Two poems by Mark A. Kliewer, MD, Associate Professor in the Department of Radiology at Duke Medical Center. Dr. Kliewer lives with his wife and three sons in Chapel Hill.

The Human Genome Project

The day the coils upon coils
 of chromosomes are unraveled,
named, and laid out
 like a train track that covers
the whole earth in ribbon,
 I will walk the rails
with the awkward half-steps
 that measure the span
from one crosstie
 base pair to the next,
as long as it takes,
 until I reach the distant
inversion that bent
 my son's life,
and left him helpless
 and alone. I will stand there
on the gravel bed, attaching
 and detaching this little
segment of the template:
 this way broke,
that way normal,
 flipping the switch
over and over,
 and wondering how
these split links,
 these loosened spikes--
absurdly small
 in thousands
of miles of track--
 should have caused
the terrific engine
 to derail
and career into fields
 of wildflower and thistle.

The Atlas of Human Developmental Standards

Book of wonders,
wedged between the texts
of anatomy and physiology
on the basement shelf,
it seemed to reveal both past and future
in the row upon row of naked bodies
arrayed across its pages
from ages 3 months to 18 years.

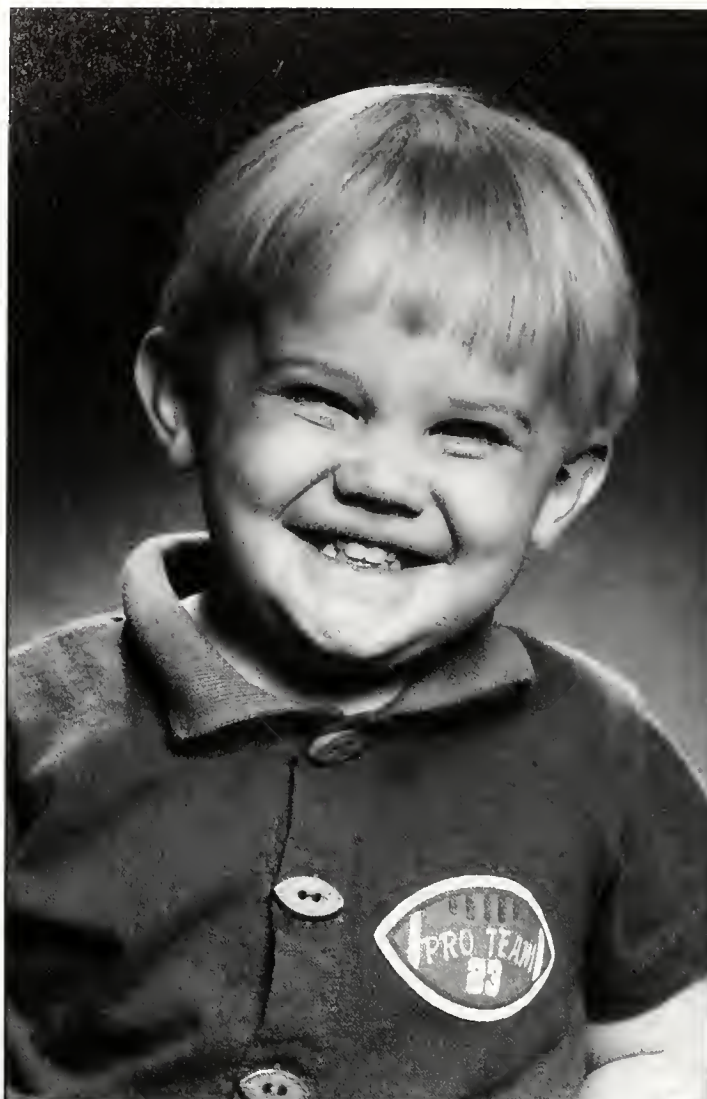
They were posed in anatomic position:
legs together, arms abstracted
from the hips, palms forward
as if about to shrug
and say *So what are you looking at?*
A string of paper dolls awaiting dress,
their contours flattened
in the photographer's flood lights.

I could see Leslie Dobbins
in female standard 12,
the dark hair, smooth shoulders,
the solid stance absent of desire
or shame, a strip of black
across her eyes like a blindfold.

Below the photo, radiographs
of her exposed skeleton
which I could see would grow and fuse
in following plates
as surely as her hips would widen,
her breasts emerge,
and that small triangle
would attain its geometrical perfection.

I was there beside her,
male standard 12, anonymous
in the pitifully round body
and smooth belly of preadolescence,
a fellow hostage in the march.
She would never know.

But in these pages, I could trace
the separate paths of our futures
laid out before us in pictures
like stepping stones,
the promise of arrival
at the last male and last female
standard, the looming boundary
of the adult world of completion.



A is for Apple,

B is for Ball,

C is for Cancer.

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Photodynamic Therapy

A Shining Light

Kevin McGrath, MD, and Scott Brazer, MD

The inability to swallow even tiny amounts of liquid produces some of the most troubling symptoms of malignant obstruction of the esophagus. Inanition, dehydration, and aspiration pneumonia are all common consequences. Sometimes, however, the treatment of the obstruction is even worse than the condition itself. The availability of a new treatment method therefore represents at least a glimmer of "good news" in an otherwise bleak landscape. We report here on such a treatment modality—photodynamic therapy, or PDT—and give an example of how its use can be helpful.

tumor was too proximal for stent placement, and the dysphagia progressed. When we saw her in September 1998, she was having difficulty swallowing even strained baby food, custard, and liquids. Endoscopy at that time revealed a mass with a 3 mm lumen which we dilated to 7 mm. Two weeks later the lumen again measured 3 mm, and she underwent photodynamic therapy. Two days after treatment, the esophageal lumen measured 8-10 mm in diameter. There was marked improvement in the patient's swallowing, and within a week she was even able to eat meat and biscuits.



Figure 1: Quartz fiber with diffusing tip placed within obstructing esophageal tumor.



Figure 2: Esophageal lumen 48 hours later. The lumen measures 8-10 mm and allows passage of an endoscope.

Our Patient

In May 1998, an 84-year-old woman developed trouble swallowing solid food. Endoscopy showed a squamous cell cancer of the proximal esophagus. Chemotherapy and radiation treatment were recommended, but she declined. The

How Light Treatment Works

Photodynamic therapy (PDT) refers to tumor ablation by photochemical reaction. The principle underlying this treatment is straightforward. A tumor-sensitizing chemical is given intravenously. After a waiting period in which the

chemical preferentially accumulates in the tumor and is cleared from normal tissues, the tumor is exposed to a specific wavelength of light. The light activates the photosensitizing chemical, which then destroys tumor tissue.¹ Though simple in concept, this treatment modality has been evolving over several decades. Recent advances in drug type, laser technology, and endoscopic delivery systems have brought PDT to clinical application.

Porfimer sodium (Photofrin®. QLT Phototherapeutics Inc., Vancouver, BC) is the only photosensitizing agent presently approved for use in the United States. It is a mixture of oligomers, each made up of two to eight porphyrin units connected by ester and ether bonds. Photofrin® is bound to plasma proteins, but there is selective uptake into neoplastic tissue for several reasons. First, the drug tends to localize in tumors because tumor blood vessels are often "more leaky" than normal vessels. Second, the drug is retained longer because of poor lymphatic drainage in tumors. Third, the drug concentrates in macrophages which are found in increased numbers within tumors. Finally, neoplastic tissue is (it is believed) relatively deficient in ferrochelatase, the enzyme that deactivates porphyrin by converting it to heme.²

Forty-eight hours after Photofrin® is given, patients undergo endoscopic delivery of light. An optical quartz fiber with a cylindrical diffusing tip is passed through the operating channel of an endoscope. The diffusing tip is positioned adjacent to the tumor or within the malignant stricture. If the tumor is completely obstructing the esophageal lumen, it can be placed directly into the neoplastic tissue. An argon-pumped dye-laser tuned to a wavelength of 630 nm delivers a predetermined light dose (300 J/cm) of non-thermal (red) light through the optical fiber. Activation of Photofrin® by red light at 630 nm generates singlet oxygen, a cytotoxic oxidizer of membranes and mitochondria. Preferential tumor cell death also occurs by ischemic necrosis, which appears to be mediated in part by thromboxane A_2 release.³ Since the laser light is not hot, and no dilation of the tumor or malignant stricture is required, the procedure is comfortable for the patient.

The treatment schedule consists of Photofrin® injection on Monday followed by endoscopic laser light treatment on Wednesday. On Friday there is an assessment endoscopy at which time, because of the kinetics of Photofrin®, an optional light treatment can be given if the tumor response was inadequate. Endoscopic debridement of necrotic tumor can be performed during follow-up endoscopy.

Advantages of PDT

PDT is currently approved by the US Federal Drug Administration as an alternative to Nd:YAG laser therapy for the palliation of totally or partially obstructing esophageal cancer. PDT is strictly palliative and by no means curative. A

large, multicenter, randomized trial of PDT versus thermal ablation with Nd:YAG laser for palliation of esophageal cancer showed that both were equally effective in relieving dysphagia, and there was no difference in duration of response or survival between the two treatment groups. On the other hand, the rate of esophageal perforation was significantly higher with Nd:YAG laser therapy than with PDT (7% vs 1%). Both squamous cell carcinoma and adenocarcinoma of the esophagus respond to PDT. A limitation of Nd:YAG therapy is its decreased efficacy in palliating long tumors, tumors in narrow or angulated areas, and flat infiltrating tumors—lesions easily treated with PDT.

Furthermore, PDT is comfortable for patients, whereas in nearly 20% of cases Nd:YAG therapy had to be terminated because of adverse events or patient intolerance.⁴ Side effects of PDT, though generally mild, are quite common, and include nausea, chest pain, odynophagia, fever, and asymptomatic pleural effusions. These side effects are believed to be due to the local inflammatory reaction induced by the treatment. One limiting and predictable effect of PDT is skin photosensitivity. In addition to neoplastic tissue, the liver, spleen, kidney, and skin take up Photofrin®. This means patients must avoid direct or bright sunlight on exposed skin for approximately 30 days after treatment. Sunscreen lotions are no help because they only block ultraviolet, not visible (red) sunlight. If trips outside are necessary, patients must cover all exposed skin. Severe blistering reactions (requiring steroid therapy and even hospitalization) can occur if precautions are not followed. Sunlight must be avoided, but exposure to ambient indoor light is actually encouraged, because it produces a photobleaching effect.

There are other ways to palliate malignant dysphagia, but external beam radiation, placement of expandable metal stents, Nd:YAG laser therapy, and serial dilation all have inherent problems and risks. Most patients who need palliation of obstructing esophageal cancer will survive for only several months. This means one must cautiously choose among the palliative options available for an individual patient. PDT has fewer risks than conventional laser therapy or stenting, but it may not be prudent to make patients photosensitive for much of their remaining life.

What the Future May Hold for PDT

PDT produces a predictable local necrosis followed by excellent healing. Because of this response other gastrointestinal applications are currently being investigated, including using PDT to ablate high-grade dysplasia in Barrett's esophagus. Esophagectomy, with its substantial associated morbidity and mortality, is currently recommended for Barrett's esophagus with high-grade dysplasia. Preliminary results with PDT show promise that it may become an attractive, nonoperative alternative to surgical resection.^{5,6} Duke Medical Center is

currently involved in a large, multicenter, randomized trial of PDT ablation of high-grade dysplasia in Barrett's esophagus.

Another promising use may be as curative treatment of superficial (T1) cancers of the esophagus in patients who are not surgical candidates. Once again, preliminary results are encouraging.⁶ Furthermore, patients with obstructing or partially obstructing esophageal cancer who are to be enrolled in a neoadjuvant chemotherapy protocol may also benefit from use of PDT to establish luminal patency and allow for oral intake.

Other experimental uses of PDT include treatment of colorectal cancer, pancreatic cancer and tumors of the biliary tree. Outside the gastrointestinal tract, PDT is being used to treat skin, bladder, and lung cancer, and for macular degeneration of the eye. The FDA has approved PDT for treatment of early lung cancer, and for palliation of obstructive lung cancer. New photosensitizing agents that produce less unwanted photosensitivity are being developed. A second gen-

eration dihematoporphyrin ether is currently being investigated for macular degeneration (verbal report, QLT Phototherapeutics Inc), and 5-Aminolevulinic (ALA) acid is being used as a photosensitizer in Europe. ALA, a precursor in heme biosynthesis, is converted endogenously to a photoactive derivative (protoporphyrin IX). ALA concentrates preferentially in the mucosa, and therefore may be ideal for the ablation of dysplastic epithelium in Barrett's esophagus and superficial esophageal cancers. Fortunately, the skin photosensitization produced by ALA lasts only 1-2 days,⁷ but ALA is not yet available in the United States for human use.

Indications for photodynamic therapy are expanding. It has proven efficacious in the palliation of malignant dysphagia. We are encouraged that PDT may become a non-surgical alternative for the treatment of high-grade dysplasia in Barrett's esophagus. The continued development of new photosensitizers with less photosensitivity makes photodynamic therapy an exciting emerging field of medicine. □

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Aphorisms of the Month

Daniel Sexton, MD, Section Editor

"A Cynic's View of Government and Politics"

In order to become a master, the politician poses as the
servant.

—Charles de Gaulle

Anybody who wants the presidency so badly that he'll
spend two years organizing and campaigning for it is
not to be trusted with the office.

—David Broder

All politics are based on the indifference of the majority.

—James Reston

It is dangerous for a national candidate to say things that
people remember.

—Eugene McCarthy

You can fool too many of the people too much of the
time.

—James Thurber

Being in politics is like being a football coach: you have
to be smart enough to understand the game, and dumb
enough to think it is important.

—Eugene McCarthy

A government is the only known vessel that leaks from
the top.

—James Reston

Every government is run by liars and nothing they say
should be believed.

—I. F. Stone

A memorandum is written not to inform the reader but
to protect the writer.

—Dean Acheson

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New Hanover - Pender County Medical Society 1999 Coastal Medical Retreat and 16th Aesculapian Sports Classic

Place: Bald Head Island
Credit: 8 hours Category I, AMA
Fee: \$250
Info: Beth Mixon, 910/343-0161 [registration]; Judy Evans, 800/432-RENT [lodging]

September 25-28

12th Annual North American Agromedicine Consortium

Place: North Raleigh Hilton, Raleigh
Credit: Up to 16.5 hours, Category I, AMA
Fees: See website: www.rheswakeahec.org
Info: Jacqueline Carter, Wake AHEC 3024 New Bern Ave., Suite G03, Raleigh 27610-1255; 919/350-8547, fax 919/350-7963; email: jgcarter@wakemed.org

November 20-21

26th Alexander Spock Symposium

Place: Searle Center, Duke University Medical Center
Fees: \$150 physicians; \$90 allied health professionals; no charge for either in training
Info: Joseph Marc Majure, MD, Box 2994 DUMC, Durham 27710; 919/684-2289, fax 919/684-2292

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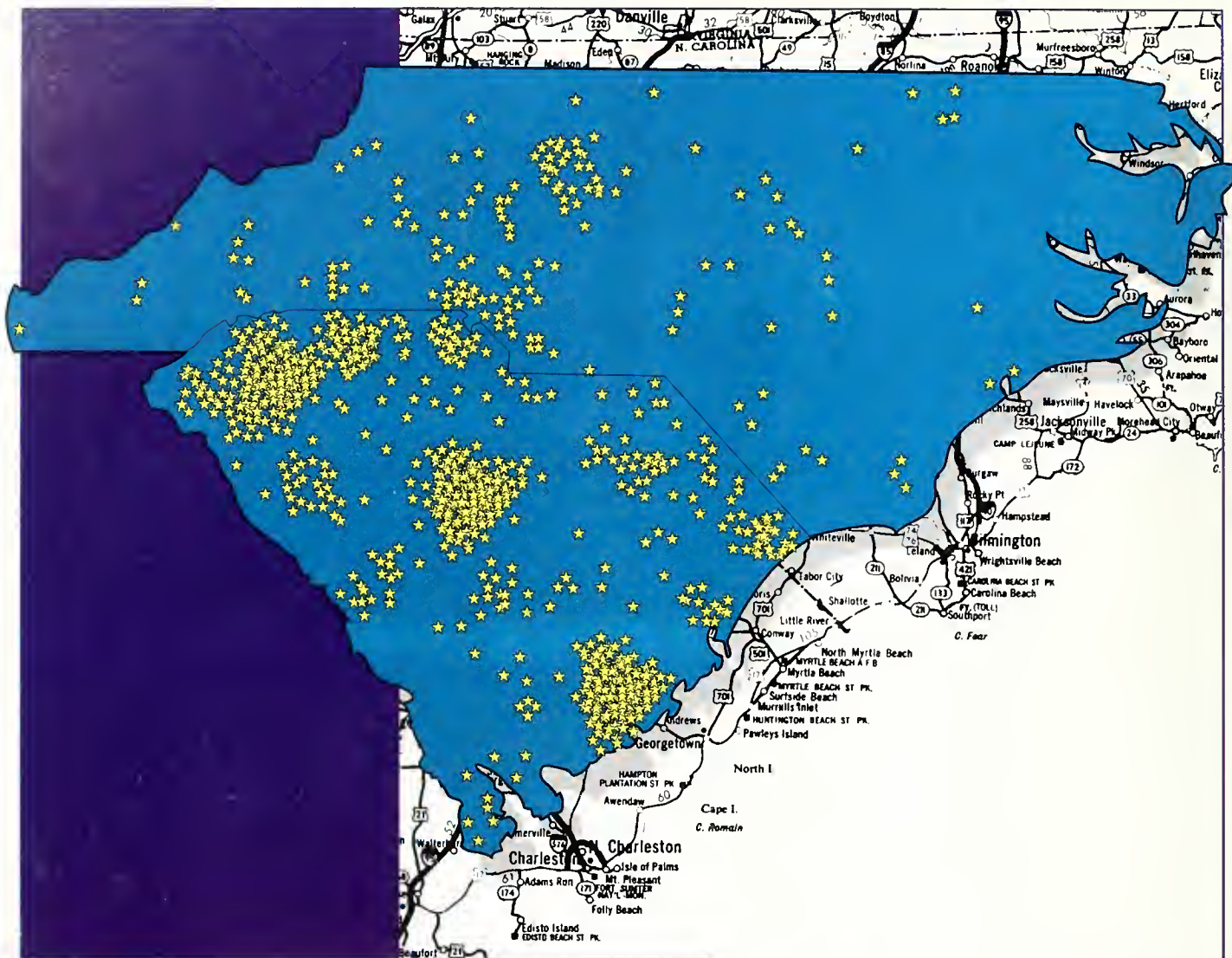
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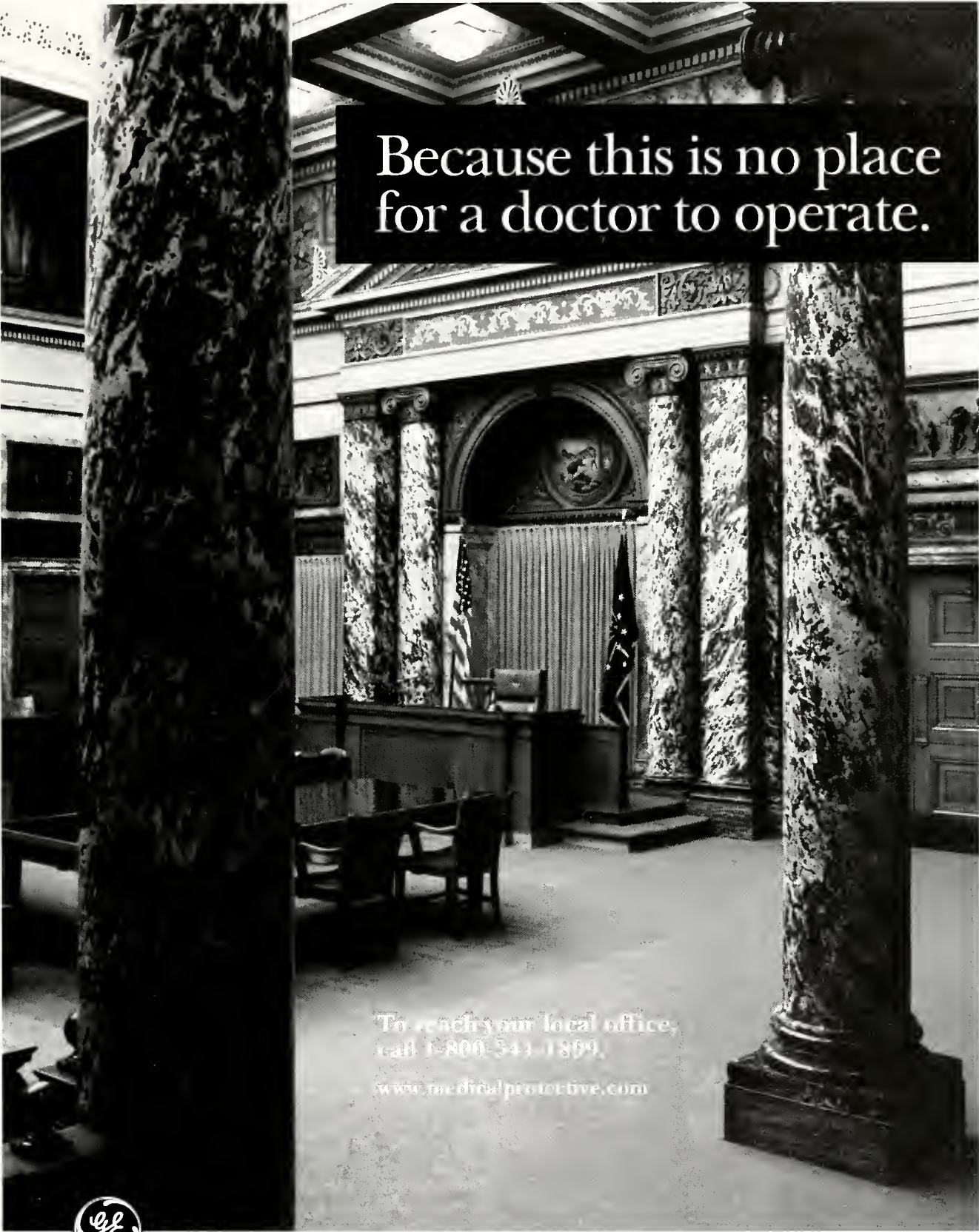
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For Doctors and their Patients

September/October 1999, Volume 60, Number 5

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—Constitution and Bylaws of the North Carolina Medical Society: Chap. IV, Section 3, pg. 4.

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North Carolina Medical Journal

FOR DOCTORS AND THEIR PATIENTS

September/October 1999 Volume 60, Number 5

Cover: A popular self-defense tool, pepper spray is produced from oleoresin capsicum, the oily extract of pepper plants. This photograph of jalapeno, serrano, and habanero peppers surrounding a typical pepper spray device is by Lewis Parrish, Duke Medical Photography.

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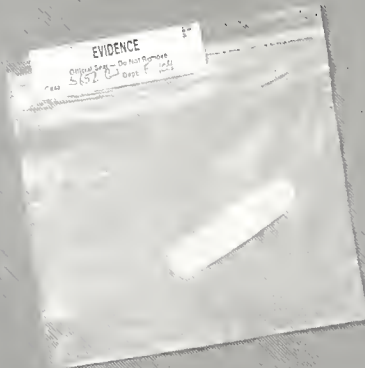


Exhibit A:

redressive bandage, which plaintiff alleges defendant pulled rapidly from skin, violently tearing three lacerations from plaintiff's arm, which resulted in severe shock, trauma, disfigurement, chronic debilitating pain and permanent psychological damage.

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The Editor's Note of Thanks

As readers of the *Journal* know, the Editor has been worried for some time about the parlous state in which medicine finds itself. Our national society has decided that doctors should unionize—a departure from previous policy that carries some risk of sacrificing our professional heritage. Prestigious medical journals have found that their very success has led to radical change in organization. All about us, there is upheaval in the house of medicine. In this setting, it is all the more deeply gratifying to find that so many of our friends have come forward and contributed their support and money on the *Journal's* behalf. We acknowledge here those generous benefactors (and others who have lent us their moral and verbal support). While the *Journal's* financial state is still more fluid than we would like, donations received up to press time bring us to the verge of being able to publish for at least another year. The *Journal* is the Society's publication. It is its contributors' legacy. Our sincere thanks to those who help sustain it.

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Letters to the Editor



The Value of SAAG

To the Editor:

I was interested to read the case report about the woman with a big belly, fever, and pain (NC Med J 1999;60:204-7). Dr. Joel Bruggen's discussion especially excited me as he mentioned the serum ascites-albumin gradient (SAAG). A little blip on the history of this occurred in 1959 with my senior thesis in medical school. Being dissatisfied with our understanding of transudates and exudates, I tapped a bunch of big bellies at NC Memorial Hospital and concurrently measured the level of albumin and globulin in the serum and in the ascitic fluid and generated a ratio of serum levels to ascitic fluid levels to use as a diagnostic tool. At that time, the total protein value was still more useful diagnostically. We did not recognize spontaneous bacterial peritonitis in those days, if it existed, and I would presume that it did. Or perhaps I was just ignorant of it.

We used a crude serum paper electrophoresis process, supplied by my preceptor in the Department of Pediatrics who was primarily interested in nephrosis, and he was not particularly impressed with my work. Thankfully, Dr. John Sessions in the Department of Medicine picked up on it immediately and encouraged me. I am very gratified to see that the SAAG has been successfully applied by subsequent generations. Thank you.

John R. Dykers, Jr., MD
PO Box 565
Siler City, NC 27344

Antipodean Kudos

To the Editor:

Just a brief note from down under to express my gratitude for your journal's excellent coverage of physician impairment. A recent Medline search in preparation for a presentation at the 1999 Australian Medical Boards Seminar directed me to the special edition published in July 1996 (NC Med J 1996;57(4)). I suspect that there has never elsewhere been published such a focused collection of literature relevant to the field. Thank you, and keep it up!

Dr. Jillann Farmer
Health Assessment Coordinator
Medical Board of Queensland
Australia

Residency Years As They Will Never Be Again

To the Editor:

I enjoyed Dr. Schiebel's recent article in the May issue (NC Med J 1999;60:129-32). Conditions were much the same during my 15-month surgical internship at The Old Grady Hospital. I made \$15 a month plus room and board.

Most of the residents and assistant resident staff had returned from the war and weren't interested in the minor surgery, particularly burns, so I had the opportunity to do many pinch grafts and cut many skin grafts with a razor held in a Kelly clamp, tensing the skin with a throat stick—rather primitive, but it worked. Also I devised a dressing by melting Furacin and impregnating it into loosely rolled sterilized gauze—it worked well. Incidentally, Mel Eaton, who founded Eaton labs, makers of Furacin, was a hospital corpsman in my father's base hospital in France in World War I.

Joseph W. Hooper, Jr., MD
2216 Gillette Drive
Wilmington, NC 28403

To the Editor:

I enjoyed Dr. Max Schiebel's article. It was reminiscent of my days at the Medical College of Virginia ten years later. I had a year of surgery, then army for two years, and returned for three years in Ob-Gyn. We had the pyramiding system in the residency program. A close friend did not get appointed Chief Resident but elected to stay on as a Senior Assistant Resident. That was never a problem. He was so good that it relieved me of many problems. When he was on call I knew things were under control.

Our pay scale at MCV was similar to Duke's. Room, board, and laundry the first two years, then \$37.50 a month the third year and for Chief Resident \$50 a month. However, if you did not want to do it, some one was standing behind you who did!

E. C. Garber, Jr., MD
1810 Lake Shore Drive
Fayetteville, NC 28305

To the Editor:

Dr. Walter Wolfe's commentary on Max Schiebel's

article (NC Med J 1999;60:133) brought back many good memories. Like him, I graduated from Temple University Medical School and interned at The Philadelphia General Hospital. In my case the numbers were 1943 and 1944. I left Temple to come to Duke in 1956.

That 9 months of internship (the year was shortened because of WW II) at "the Medical Almshouse," as we came to know it, was the most enjoyable time of my years in medicine. We received "free" room and board, and the princely sum of \$35 a year (a net loss of \$15, as uniforms cost \$50.) In that distant age all internships were rotating; I spent 3 months each on medical and surgical services, with the rest on other specialties. The hospital housed several thousand patients, with an intern staff of 35-42 and 6 residents. Attendings attended irregularly, themselves hard-pressed by wartime shortages of doctors for civilian patients. On my first medicine rotation I had 30 general medical patients, 3-6 more on the infectious disease ward, and 90 on the tuberculosis unit, where I had the opportunity to scrub with Dr. Bailey of Hahneman Hospital, one of the first to do pneumonectomies in the city. On surgery I was privileged to assist Dr. Eliason, then Chief at Penn, a fine gentleman, a superb teacher, and one of the best surgeons of his day.

Call was alternate nights and alternate weekends, but usually one had to work on the night off in order to catch up with chart work, and to finish patient care that had accumulated during the day. Halfway through the year someone had the bright idea to check the dining room staff, and we discovered that one of the cooks and two waiters had active tuberculosis. Several of our group and a number of student nurses developed active lesions during my time there. Few of us were married, but several years later there was a much larger married faction. The wives of that group applied for welfare, on the grounds that the salaries paid qualified them for help, but the City Council passed special legislation exempting the house staff from relief.

All in all, it was an exciting time. In spite of the inconveniences it was a great learning experience. Above all it taught us humility, a willingness to assume responsibility, and the reward of knowing that we were entering a great profession dedicated to helping others.

John M. Rhoads, MD
163 Montrose Drive
Durham, NC 27707

From the Editor:

Dr. Schiebel's article stirred a good many memories among our readers, and we are pleased to share some of them here. Dr. Shiebel's reminiscences reminded Dr. Norris Smith of a talk he gave a few years back, which he has graciously permitted us to reprint (slightly edited) on the following page.

Heather L. Cook

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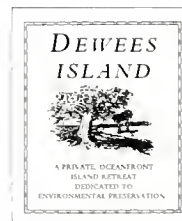
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Greensboro Medicine "Before the War"

O. Norris Smith, MD

I received my MD in 1933 from the University of Pennsylvania Medical School, where tuition had been \$500 a semester and only six of my 119 classmates were married. I won a prized two-year rotating internship at the old Pennsylvania Hospital, founded by Ben Franklin in Philadelphia, in return for "room, board, uniforms, and laundry," followed by a two-year residency at the Hospital of the University of Pennsylvania for "room, board, laundry, and \$25 a month." And then an eight-month assistant residency at Duke Hospital for "room, board, and \$35 a month," before opening my office for the practice of internal medicine on March 15, 1938, in the Jefferson Standard Building in Greensboro.

Greensboro's population was approaching 50,000, served by about 85 white and 5 black MDs; the great majority were self-proclaimed Physicians and Surgeons. Among the older established specialists were several EENT men, one psychiatrist, one orthopedist, one urologist who did not perform major surgery, three pediatricians, one cardiologist, and two Mayo-trained surgeons (one of whom was noted for his skill with pneumonia patients). Shortly before my arrival several young specialists had bravely hung out their shingles — two orthopedists, two obstetrician-gynecologists, one internist, and one surgeon; a new urologist soon left Greensboro for Charlotte, as did many Greensboro patients needing prostatectomy, thyroidectomy, or cataract extraction. (My own mother went to Charlotte for cataract extraction, was kept hospitalized in bed with sandbags beside her head for *two weeks* to guard against hemorrhage.)

The 2nd, 3rd, and 4th floors of the Jefferson Standard Building were wholly occupied by doctors, and I was able to subdivide 1-1/2 rooms at \$50 a month and hire an untrained middle-aged "receptionist" at \$50 a month — what Jefferson Standard paid their many female clerks. Manuel's restaurant next door on West Market served a good counter lunch — meat, two vegetables, drink, and dessert for 38 cents, includ-

ing tax. Gasoline cost 22 cents a gallon, my office phone \$6.80 a month, postage stamps were \$3 for 100, and automobile liability insurance was \$36 a year.

Remember, those were real dollars: in 1939 I bought a new Ford for \$996, less a \$296 trade-in, and in 1940 I bought a Westinghouse fluoroscope for \$704 at \$39 a month for 18 months. I borrowed \$300 at 6% interest at the bank, and was still indebted to them when I left for the Army four years later in 1942!

I joined the County Medical Society at \$10 a year, and the State Medical Society at \$12.50 a year; I subscribed to JAMA at \$7, the Archives of Internal Medicine at \$5, and the New England Journal of Medicine at \$6. A two-day trip to Cleveland for my American College of Physicians examination cost \$91: \$51 for train fare, \$18 for hotel, \$17 for meals, and \$5 for incidentals. My professional liability insurance cost \$18 a year! City and county taxes on my office furnishings totaled \$32.52 that first year.

Hospital insurance had just recently been started in Durham for mill employees, spear-headed by Dean Davison of Duke. Cone Mills offered an early insurance (*not* Blue Cross) for employees, which allowed \$25 for tonsillectomy, \$75 for appendectomy, and "50 cents a day not to exceed 8 days" for medical hospitalization! The senior hospital staff doctors jealously guarded the emergency room and the empty beds: my acidotic diabetic might be refused admission unless near-comatose. Wesley Long Hospital's per diem bed rate was \$3 a day, and the hospital nurses worked 12-hour shifts. The lack of hospital beds was a serious problem, with no immediate prospect of improvement. Because of the tremendous endowment for the Moses H. Cone Memorial Hospital—anticipated since 1911—the City Councils of both Greensboro and High Point, and the Guilford County commissioners, were able to defer any appropriation towards hospital construction (except for the tuberculosis sanitarium at Jamestown), and the Cone Hospital was not to open for another 15 years!

My office charges were \$3 for a "simple" or return visit, \$15 for a "complete" workup, \$1 for a urinalysis, and \$3 for a CBC; home calls were \$5, and collections uncertain. Ministers, doctors, and their dependents were not charged for

Dr. Smith is retired from his internal medicine practice in Greensboro. This article is taken from a talk he gave at the 50th Anniversary Greensboro Medical Symposium, April 29th, 1997.

medical care. At that time, there was a spirit of competition rather than cooperation between the doctors and the Health Department.

High Point doctors all belonged to one hospital staff, where they dealt with High Point problems. Greensboro doctors were chiefly active at one or two of the city's five hospitals: St. Leo's and Sternberger both on Summit Avenue, Piedmont and Wesley Long downtown, and L. Richardson Hospital for the Colored in Southeast Greensboro. There was no staff meeting adequate to deal with Greensboro's medical problems, and the High Point members of the County society objected to discussion of Greensboro's problems in that forum.

With the outbreak of World War II, 33 of the 90+ Greensboro doctors entered military service. Immediately after the war ended, the County Health Officer resigned and the County Commissioners elected a successor without any consultation or request for advice from the local medical community. This provoked such an outcry that the newly appointed doctor decided to stay where he was!

This was the straw that provoked action!

After some preliminary committee work to draw up a constitution and bylaws, a letter went out on Feb. 25, 1946, inviting "every doctor of medicine who had maintained a Greensboro office for at least one year and who was a member in good standing of the County Medical Society" to attend a dinner meeting and become a charter member of the proposed Greensboro Academy of Medicine, explaining,

It is our feeling that we do not need any more of the conventional scientific programs, but rather we need to devote much time to discussion of local problems—public health matters; relations with allied professional groups; illegal practice of medicine by cultists; persistent difficulties with insurance companies, the Veterans Administration, the State Compensation Commission, and other powerful groups against which we are individually powerless; cooperation with the Chamber of Commerce with respect to local hospital needs; influence with credit bureaus whereby unpaid medical bills might reflect upon an individual's credit rating; and other such matters where our unified voice might be effective.

Seventy-seven charter members attended that first meeting on March 4th, 1946, a unity of action by the medical profession that has seldom since been seen in Greensboro!

Guidelines for Letters: We welcome reader feedback. Type and double space all letters; keep length to under 500 words. We may occasionally publish longer letters as commentaries. We reserve the right to edit and abridge submitted text. Send letters to us at Box 3910, DUMC, Durham, NC 27710, 919/286-6410, fax: 919/286-9219, e-mail: nash0004@mc.duke.edu



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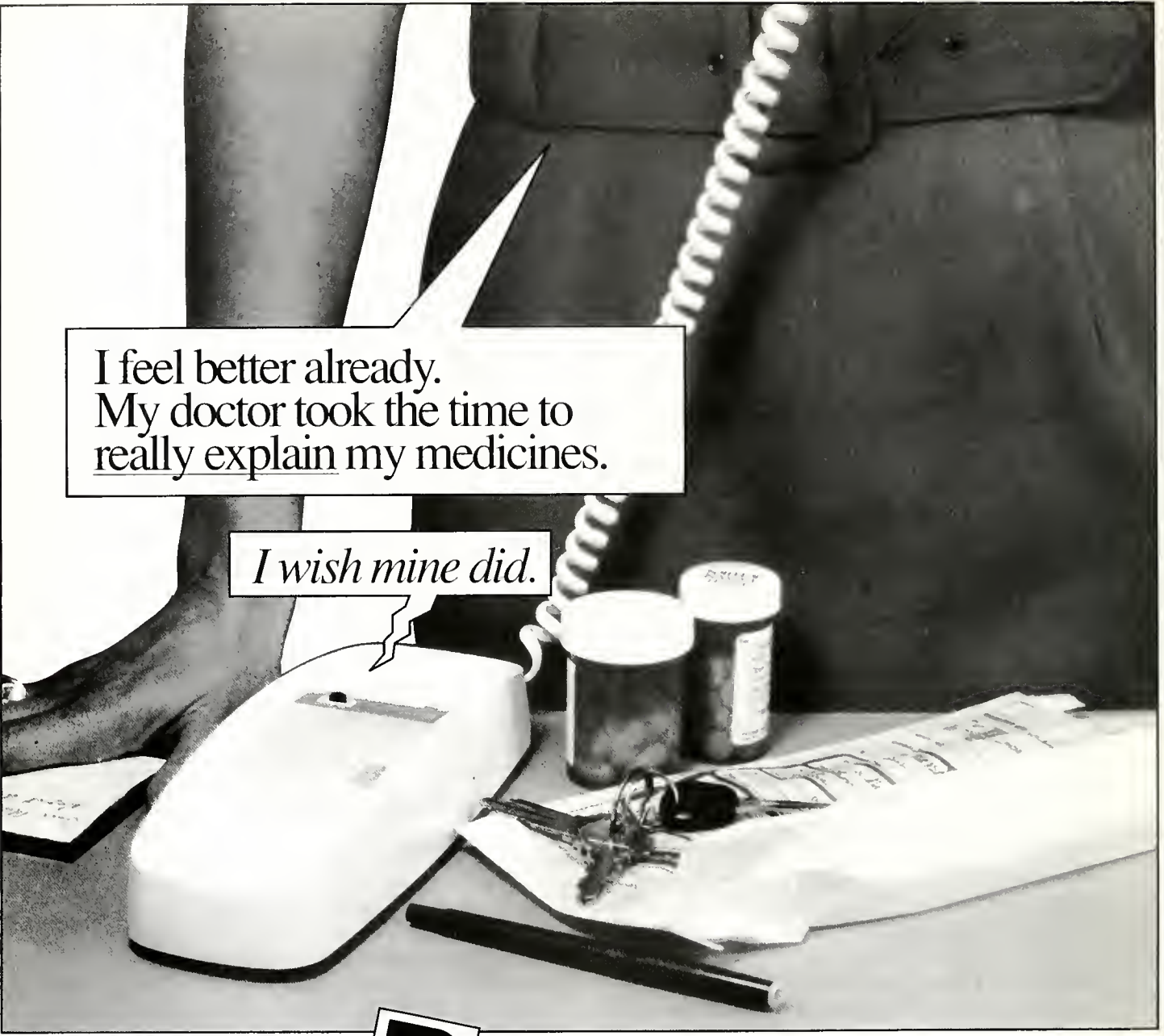
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Why Do Critically Ill Newborns Not Get Mandated Screening?

Pamela J. Reitnauer, MD, PhD, Shu Chaing, PhD, and Joseph Muenzer, MD, PhD

Newborn screening programs can identify treatable genetic and metabolic disorders very early in life.^{1,2} This has led state departments of health to provide mass newborn screening programs throughout the United States.³ The North Carolina program began in 1965 with the creation of a high-quality newborn screening laboratory in Raleigh, and the state-wide education of physicians, nurses, and newborn nursery staff on the importance of screening newborn babies for phenylketonuria, galactosemia, sickle cell disease, congenital adrenal hyperplasia, and congenital hypothyroidism.⁴ Since August 1997, the program has been expanded to screen newborns for amino acid, organic acid, and fatty acid oxidation disorders.

Screening is carried out by collecting a sample of blood from the heels of newborns, drying it on filter paper, and mailing it to the state laboratory in Raleigh. The state newborn screening program requests that samples be collected from infants at 24 to 72 hours after birth, but samples should be collected even if infants are to be discharged or transferred before 24 hours. When samples are collected prior to 24 hours, a second blood sample should be collected by age one week, and also sent to the state newborn screening laboratory.

Despite these well-established policies, there has been concern that newborn screening may be delayed or even omitted in critically ill infants who require transfer to one or many hospitals. To assess the validity of this concern, we determined the number of critically ill infants in whom screening was delayed or missed completely.

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Methods

We retrospectively identified consecutive transfer admissions of infants less than 21 days of age to the University of North Carolina (UNC) Hospital between July 1, 1994, and June 30, 1996. Infants were excluded if they had been discharged home prior to readmission to and transfer from another hospital. The study was approved by the UNC Institutional Review Board.

UNC medical records of all study subjects were reviewed, and recorded information about newborn screening was verified from the records of the state newborn screening laboratory. The age at time of transfer was determined from data obtained by the transport team or from information sent by the referring hospital. The Director of the state newborn screening laboratory (S.C.) searched the state database according to the infant's gender, surname, mother's name, birth date, and hospital of birth. The state data were reviewed to identify screening that had been carried out to one year after the end of the study period. Data from the UNC medical records and the state newborn screening laboratory were merged for analysis.

Results

During the two-year study period, 356 infants were transferred from 47 other hospitals; 219 of the 356 (61%) were less than 24 hours of age at transfer, and only 9 of them (4%) had been screened before transfer (Table 1). Rate of screening before transfer clearly increased with increasing infant age so that by age 72 hours or older, 52 of 64 infants (81%) had been screened by the referring hospital. Nevertheless, *in toto*, 75% of infants had not been screened before transfer.

As shown in Table 2, 84% of infants were directly admitted to the neonatal intensive care unit (NICU). Other sites of initial admission were the newborn nursery (1%), pediatric intensive care unit (11%), pediatric ward (3%), and

Table 1. Age and screening status of critically ill neonates transferred to UNC Hospital

| Age at arrival* | Screened pre-transfer | Not screened pre-transfer | Total |
|-----------------|-----------------------|---------------------------|------------|
| <24 hours | 9 (04%) | 210 (96%) | 219 |
| 24-48 hours | 20 (36%) | 36 (64%) | 56 |
| 48-72 hours | 8 (47%) | 9 (53%) | 17 |
| >72 hours | 52 (81%) | 12 (19%) | 64 |
| Total | 89 (25%) | 267 (75%) | 356 |

*at UNC hospitals

Table 2. Admitting service and status of newborn screening

| Admitting service | No. of infants | Screened before transfer | Screened after transfer | Screened after discharge | Total screened | Died before screening | Never screened |
|-------------------|----------------|--------------------------|-------------------------|--------------------------|----------------|-----------------------|----------------|
| Neonatal ICU | 299 | 66 | 211 | 5 | 282 | 9 | 8 (3%) |
| Newborn Nursery | 3 | 0 | 3 | 0 | 3 | 0 | 0 |
| Other Services* | 54 | 23 | 10 | 3 | 36 | 4 | 14 (26%) |
| Total | 356 | 89 | 224 | 8 | 321 | 13 | 22 (6%) |

*pediatric intensive care unit, pediatric wards and pediatric surgical wards

pediatric surgical ward (1%). A total of 43 infants did not receive mandated screening during or before their admission to UNC Hospital; 8 were subsequently screened at another hospital or in a physician's practice. Thus, 35 of the 356 infants (10%) were never screened, but an eventual total of 321 (90%) were. Thirteen of the unscreened infants died, most because of extreme prematurity or severe congenital heart disease. Of the 54 infants admitted directly to services that do not care for newborns exclusively (pediatric intensive care unit, pediatric or pediatric surgical wards), 18 (33%) received no screening compared with 6% of infants admitted to the neonatal units. Most of the infants who were never screened were hospitalized on more than one service after admission.

Discussion

Because newborn screening protocols focus on term infants, there is a high risk that screening of critically ill infants will be delayed or omitted.⁵ Our study of critically ill infants transferred from local hospitals to a tertiary care center during a two-year period shows that there is a sizeable risk that screening will be delayed or missed. This happened for a variety of reasons: (1) Only a quarter of the infants in our study had been screened prior to transfer. (2) When they were

admitted not to the neonatal intensive care unit but to a service on which newborn screening is not routine, there was a much greater chance that screening would be omitted. (3) The critical acuity status of these infants makes it likely that screening will be overlooked. A Canadian study, which matched live birth registration data with newborn screening data over a one-year period, found that low birth weight or death at less than one week of age was associated with missed screening.⁶

Fewer transferred infants would "fall through the cracks" if the state guidelines for newborn screening were followed as they have now been revised (that is, that blood samples be collected prior to transfer). Better education and ascertainment efforts would also help. Using hospital-based newborn screening coordinators (at least in the tertiary care center) to track all infants is another possible solution. This would be most helpful in infants who are transferred to multiple services within the first few days or weeks of life.

Even though collecting samples prior to transfer might mean collection at less than the optimal time for some newborn screening tests, registration forms (preferably with a blood sample) should always be submitted so that the infant will be registered and tracked by the state newborn screening laboratory. This would allow prompt notification for subsequent collections. The current State of North Carolina newborn screening guidelines are listed in Table 3.

Table 3. North Carolina Newborn Screening Guidelines*

- 1 A blood specimen (heel blood) should be obtained from every infant prior to discharge or transfer to another hospital regardless of age. The number or type (breast or formula) of feedings will not affect this rule.
- 2 Infants discharged and screened prior to 24 hours of age should have a repeat screening test performed by one week of age. It is the responsibility of the infant's health care provider whose name is noted on the newborn screening form to obtain this second specimen in a timely manner. *(Parents should be informed that the infant is being retested because of early discharge from the hospital, not because the infant has an increased risk of metabolic disease).*
- 3 Premature or ill infants or infants receiving parenteral feeding should be screened between 24-72 hours of age. The status of feedings will not affect this policy. The sample should not be obtained from a central line when an amino acid solution is being infused.
- 4 Any infant transferred from a local hospital to a major medical center for post-natal care should have a blood specimen collected for screening within 48 hours of arrival at the major medical center. Optimally, this specimen should be collected before the infant is transfused. When screening for hemoglobinopathies, a repeat specimen should be collected four months after the last transfusion.
- 5 If a blood specimen cannot be collected due to parental refusal or other reasons, a newborn screening form with the baby's demographic data should be submitted to the state laboratory.

*Memorandum from Dr. Ann Wolfe, Director, Division of Maternal and Child Health, dated 1/27/97.

Repeat samples should be taken at no later than age one week in infants who are critically ill or premature and from whom an initial sample is collected at less than 24 hours of age. An on-going North Carolina study of very low birthweight babies (<1500 grams) has detected three with suspected late-onset hypothyroidism (low T4 and elevated TSH), who would have been missed if they had had only the initial screen. The State of North Carolina Newborn Screening Advisory Committee therefore recommends the following addition to the newborn screening guidelines: *All infants weighing <1500 grams at birth shall have a repeat specimen collected at 4-6 weeks of age. If the infant is discharged prior to this time, a repeat specimen shall be collected at the time of discharge, and an additional specimen collected at 4-6 weeks of age.*

The identification of an abnormal screening result in an infant, regardless of the survival outcome, is important for genetic counseling of families. In addition, any of the screened conditions could pose significant co-morbidity for a critically ill infant unless detected early. Those who care for critically ill newborns need to verify whether screening has been done. If not, they need to submit a sample promptly to the state laboratory.

We are not doing badly, but we can and need to do better.

Acknowledgements

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A Report on How North Carolina Is Improving Mammogram Quality

Gerald G. Britt, BA

Congress passed the Mammography Quality Standards Act (MQSA) in 1992. Before that time, poor mammography equipment, a lack of quality control procedures, and a lack of quality assurance procedures compromised the quality of many mammograms. Radiologic technologists needed to improve their skills in properly positioning patients and in properly exposing the radiographic film; radiologists needed to improve their skills in the subtleties of interpreting mammograms. MQSA established national standards to ensure that women all over the country had access to the best possible mammograms, since only high quality mammograms can detect breast cancer at its earliest, most curable stage. Because screening mammograms can often detect microcalcifications and tumors before they can be felt, a good mammogram can give a woman up to a two-year head start in detecting a malignancy. Maximizing the outcome of costly treatment is money well-spent, to say nothing of the lives saved and improved by early diagnosis.

MQSA required that all facilities (except VA facilities) legally providing mammography services after April 1, 1994, had to be accredited by an approved accrediting body, and all facilities had to be certified by the Federal Drug Administration (FDA). In North Carolina, the American College of Radiology (ACR) is the accrediting body. In the middle to late 80s, the ACR established voluntary standards for mammograms (the American College of Radiology Mammography Accreditation Program). Beginning on January 1, 1992, the ACR Mammography Accreditation Program required that accredited sites perform and maintain records of the quality control tests set out in the ACR Mammography Quality Control Manual.

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What the ACR Has Done

Accreditation guidelines issued by the ACR have improved quality control and quality assurance. ACR readers evaluate phantom images and clinical images from facilities seeking accreditation, and grade those facilities as passing or failing. Every link in the imaging chain receives focused attention. In addition, the ACR sets initial and continuing education qualifications for radiologists, radiologic technologists, and medical physicists. As a result of these measures, quality control standards are in place that assure continuous improvement in image quality. In addition, there are quality assurance standards for record keeping, and requirements for reporting and patient notification.

FDA-trained state inspectors use MQSA regulations and guidelines to look closely into three areas that affect quality: personnel, equipment, and record keeping. Facilities are cited when they do not meet the recommended guidelines. Depending on seriousness, three levels of non-compliance are cited. Level 1, the most serious citation, indicates that a facility has failed to meet a key MQSA requirement, one that might compromise mammography services (for example, failure to make a proper phantom image). These inspection efforts have had a remarkable effect: In 1995 there were 26 Level 1 citations in North Carolina, but only four in 1998, an 85% decrease in Level 1 citations. The picture is even more clear if we look at total citations, since the total of Level 1, Level 2, and Level 3 violations summarizes the total performance of North Carolina facilities. In 1995, only 22 (9%) of the 231 facilities inspected received no citations; in 1998, 114 (47%) of 244 facilities received no violations. There has been a year-by-year improvement (see Table), so that by 1998 the number of total citations had dropped by 80% compared to 1995.

The determinant of technical quality is the phantom image test. Data from inspections undertaken before and

Table. Decline in citations for failure to adhere to MQSA guidelines

| Year | Facilities Inspected | No. with no citations | Percentage |
|------|----------------------|-----------------------|------------|
| 1995 | 231 | 22 | 9% |
| 1996 | 214 | 83 | 39% |
| 1997 | 225 | 84 | 37% |
| 1998 | 244 | 114 | 47% |

again after implementation of MQSA show that image quality has improved significantly. Nationally, 98% of the facilities had acceptable scores in 1998, compared to 89% before MQSA was enacted. North Carolina followed this pattern.

Further Measures to Improve Mammography

In 1990, Congress enacted the Breast and Cervical Cancer Mortality Prevention Act. This authorized the Centers for Disease Control and Prevention to establish cooperative agreements with states to ensure regular screening of women (especially those 50 years of age and older) for breast and cervical cancer, and to provide prompt follow-up and testing in accordance with current recommendations for quality assurance. Mammography in North Carolina has benefited from the infusion of funds from the Breast Cancer and Cervical Cancer Prevention (BCCCP) program. The BCCCP grant allows North Carolina to pay for a mammography educator/consultant, and funds a contract with the Department of Radiology at the University of North Carolina at Chapel Hill which provides consultation to mammography facilities, as well as continuing education programs for radiologists and radiologic technologists.

Mammography quality control, quality assurance, and professional education courses are provided at five regional Area Health Education Centers facilities throughout the state. These workshops and courses have contributed to the incremental improvement in image quality and improved diagnosis. The Division of Radiation Protection and its FDA-trained inspectors are committed to continuous improvement in mammography. They work closely with the mammography educator/consultant and UNC-Chapel Hill to intervene when some aspect of imaging needs improvement in general or at a particular facility.

The North Carolina Chapter of the American College of Radiology holds a mammography review course every January. Each year this popular course educates about 250 radiologists, technicians, and radiation physicists in current mam-

mography protocols and practices. The Division of Radiation Protection and the North Carolina Chapter of the ACR have worked together to make a smooth transition to the Final MQSA Regulations (effective on April 28, 1999). The NC ACR and Division of Radiation Protection communicated with every ACR-certified facility in North Carolina the importance and the impact of the new regulations initiated by the FDA.

What We Have Done

Health professionals in North Carolina are committed to providing high quality mammograms for screening and diagnosis. The combined efforts of the medical community, medical imaging companies, and breast cancer advocacy groups have improved and will sustain excellence in breast imaging, allowing women to protect themselves through screening mammography. The evidence is clear. The incidence of breast cancer has changed very little in the 1990s, but the death rate for breast cancer has been declining about two percent per year since 1990. The decline is linked to breast cancer awareness, early detection, and better treatment. □

Erratum: The article in the last issue entitled "North Carolina Childhood Asthma Management Initiative: A Summary of the Summary Report" (NC Med J 1999;60:223-6) should have listed the following as authors: William Furney, Stanley I. Music, MD, DTPH (Lond.), and Jerry Wiley, MD. We regret the miscommunication.

Not Every Prostate Cancer Needs To Be Treated

The Place for Expectant Management

Andrew S. Griffin, MD, FACS, and Maureen E. O'Rourke RN, PhD

*Oftentimes, in the treatment of disease,
to do nothing is to do everything.*
—Giovanni Battista da Monte, ca. 1530

Carcinoma of the prostate is now the most common cancer of men in the US, diagnosed in over 180,000 men this year and accounting for over 39,000 deaths annually.¹ But controversy and uncertainty still surround screening and early detection, treatment choices, the management of treatment-related side effects, and what to do about recurrent disease. The last decade has seen a dramatic increase in media coverage of prostate cancer, including personal testimony from famous men (such as Intel Corporation's CEO, Andy Grove, Gulf War hero General Norman Schwarzkopf, and presidential candidate Bob Dole) supporting aggressive treatment and frankly discussing previously taboo issues like impotence and incontinence.^{2,3} It would be hard, however, to name any public figure who has spoken from personal experience in favor of the option of "expectant management."

We presently have three ways to treat early stage prostate cancer: radical prostatectomy, radiation therapy (either external beam or brachytherapy, in which radioactive seeds are placed in the prostate), or expectant management. Expectant management (also called "watchful waiting," "observation," or "surveillance therapy") means careful monitoring of prostate status followed by active treatment if and when tumor progression causes symptoms.⁴ Given the varying rate of progression, it may take 10 years before treatment is needed.⁵ There is a common misconception that patients are ignored during such surveillance; in fact they are monitored at regular intervals by digital rectal examination (DRE) and prostate-specific antigen (PSA) testing.⁶

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Both patients and doctors must evaluate several factors in choosing the best treatment option: estimated life expectancy (including the potential effect of foregoing active treatment); unwanted treatment effects such as incontinence or impotence; and threat of other morbidity associated with treatment. Equally important are the personal, marital, and cultural implications of each option. Physicians must be familiar with all options in order to help each patient make the best choice. In this article we review the option of expectant management, its rationale in early-stage prostate cancer, the therapeutic goals, and the criteria for patient eligibility. In addition, we discuss the care of patients who select this option, emphasizing psychosocial and patient education aspects.

The Rationale for Expectant Management

The expectant management of early-stage prostate cancer is based on the observation that the incidence rates for prostate cancer far exceed the death rates. An American man has a 10% lifetime risk of developing prostate cancer, but only a 3% risk that he will die of the disease.⁷ This leads to the conclusion that more men "die with" the disease than "die of" the disease. In arguing against aggressive therapy with its resultant side effects, proponents of expectant management cite the slow growth of prostate cancer, the mounting evidence that surgery or radiation may not improve overall survival,⁸ and the diminished quality of life in previously asymptomatic men who develop distressing side effects of treatment.

The discovery of PSA and its widespread use as a screening test has increased the detection of prostate cancers before they are palpable on DRE. Some speculate that we may be detecting tumors that are clinically insignificant. It is

true that cancers detected by PSA screening are more likely to be localized and thus potentially amenable to early intervention. However, these same tumors may not, over the patient's lifetime, cause any significant symptoms. Critics contend that the phenomenal increase in the number of diagnosed cases of prostate cancer since the introduction of PSA testing has improved neither the duration nor quality of life.^{8,9} The American College of Physicians says there is an average gain in lifespan of 3 years for young men with prostate cancer who are treated aggressively with radical prostatectomy or radiation therapy; this falls to 1.5 years for men in their 60s, and a mere 0.4 years for men in their 70s.¹⁰

Expectant management has been the favored treatment of prostate cancer in Europe for more than 30 years. In the United States, interest has increased over the past 4-5 years following the publication of several reports indicating comparable survival at 10 and 15 years for men treated expectantly or with curative therapy.¹¹⁻¹³ In a frequently quoted study, Johansson et al¹¹ retrospectively assessed 233 patients (mean age 72 years) with early-stage (mostly low-grade) prostate cancer, who received no treatment until they became symptomatic and then received hormonal therapy. After a mean of 15 years follow-up, the disease-specific survival rate was 81%, a rate comparable to that of men who had undergone medical or surgical treatment. The investigators concluded that expectant management is a reasonable choice for men with localized prostate cancer.

There are no prospective, randomized trials of expectant versus active treatment, so justification for this conservative option is based on retrospective data. Goodman and colleagues¹⁴ reviewed 69 cases of men in whom prostate cancer was diagnosed incidentally at subtotal prostatectomy. The men received no treatment unless symptoms developed, in which case they received hormonal therapy. Many patients died (of non-prostate causes) without evidence of disease progression. Men younger than 70 years of age who had diffuse, high-grade cancer were at increased risk of symptomatic progression, most notably skeletal metastasis, within 3 years.

Adolfsson⁴ reviewed 12 studies using various survival endpoints including overall survival, progression-free survival, and disease-specific survival. Adolfsson concluded that 34-72% of prostate cancer patients who chose expectant management survived for 10 years. Progression-free survival at 10 years, using bone scans to measure metastatic disease, ranged from 43-77%. He pointed out that disease-specific survival (the chance of either being alive or having died from

some disease other than prostate cancer) is a less robust endpoint than overall survival because it depends on accurate establishment of cause of death. Still, he found disease-specific survival rates to range from 74-87% at ten years. Criticisms of all retrospective studies apply, including patient selection bias, and the possibility that men in the expectantly managed group were often older, had smaller tumors, and had slower disease progression, because these factors make it more likely that such men will die of non-cancer causes.

A single randomized trial comparing radical prostatectomy to expectant management found no significant difference in survival rates over 15 years, but this study has been severely criticized for design flaws.¹⁵ The lack of good, randomized clinical trials demonstrating the efficacy of active treatment has led the United States Preventive Health

Services, the Canadian Task Force on Periodic Health Examination, and the American College of Physicians to recommend against routine PSA testing to detect prostate cancer.^{10,16} Given the lack of scientific evidence, the National Cancer Institute and the Veterans Affairs Cooperative Studies Group have undertaken a large-scale randomized trial to compare radical prostatectomy to expectant management for clinically localized prostate cancer (Prostate Intervention Versus Observation Trial—PIVOT). The study, launched in 1995, planned to enroll 2,000 patients over a three-year period and to follow these men over 12 years, for a total of 15 observable years. Eligibility requirements included the following: age 75 years or less; estimated life expectancy of 10 years or more; clinically localized prostate cancer; and diagnosis within the preceding 6 months.¹⁷

The trial is active and ongoing, but there has been difficulty recruiting participants. In 1997, after 2 years of recruitment, PIVOT had enrolled only slightly more than 400 men,¹⁸ resulting in the sample size being decreased from 2,000 to 1,050 and recruitment extended from 3 to 7 years.¹⁹ Until data from PIVOT are available, we will have to deliberate the value of expectant management without the benefit of solid scientific evidence for or against.

"Expectant management (also called 'watchful waiting,' 'observation,' or 'surveillance therapy') means careful monitoring of prostate status followed by active treatment if and when tumor progression causes symptoms."

The Case Against Expectant Management

There is good evidence that radical prostatectomy and radiation therapy offer the possibility of complete tumor eradication and cure. In addition, active treatment may reduce

patient anxiety and uncertainty. Treatment with either radiation or surgery may reduce the risk of metastasis and the need for subsequent intervention,²⁰ but Aus and colleagues¹³ found that 63% of men with prostate cancer that was not metastatic at diagnosis and who survived for more than 10 years eventually died of prostate cancer. Just as expectant management involves risks, so does intervention with radical prostatectomy or radiation.

Early enthusiasm for the expectant management of patients with localized prostate cancer has been tempered by reports indicating that it may take 10-15 years for the full impact of active intervention to become apparent.²¹ Younger men who undergo expectant management have a high risk of developing incurable disease and dying from prostate cancer.^{13,22} McLaren and associates²³ followed 113 untreated men (mean age 75 years); 40% of those with early-stage disease and 51% of those with more advanced disease had clinical progression within 2 years.

In their comprehensive review of the arguments against expectant management, Hugosson, Aus, & Norlen²⁴ pose three salient questions: Is prostate cancer a major health problem? Is current prostate cancer mortality acceptable? Is it worthwhile to decrease prostate cancer mortality? The magnitude of prostate cancer as a public health problem is obvious. In 1998 alone, 184,500 new cases and 39,200 deaths were expected in the United States.¹ Hugosson et al suggest that the relative costs of prostate cancer care should not be based solely on the costs of curative treatment; rather, the cost of prolonged and severe morbidity associated with untreated disease must be considered, especially the sequelae of metastasis (pain management, obstruction, palliative radiation, and upper urinary tract diversions). They caution that the dominant costs associated with prostate cancer care are those of hospital care, often in the final year of life. The authors maintain that expectantly treated prostate cancer patients die either from the disease or from co-morbidities already present that do not allow sufficient time to develop prostate cancer progression. They think that surveillance is a poor option because of the high financial and personal costs of pain, suffering, and death from progressive disease.

Who Is Eligible for Expectant Management?

The therapeutic goals of expectant management are to spare early-stage prostate cancer patients unnecessary treatment-related toxicity, and to maintain reasonable quality of life

without compromising overall survival. These require maintaining the patient's sense of well being, even in the face of considerable uncertainty.

It is increasingly apparent that prostate cancer exists in two distinct forms: a clinically insignificant form that poses little threat to men's lives and well-being, and a clinically significant form that poses the threat of sickness and death. Clinically significant tumors are characterized by large tumor volume, rapid elevation of PSA (>50% increase per year from the initial PSA level), and a Gleason score of ≥ 7 .²⁵ There is no consensus yet about how to determine which kind of tumor a patient has, but expectant management can be considered a plausible option for men with a life expectancy of 10-15 years or less (due to illness or advanced age), for

asymptomatic men with tumors too advanced to cure, and for men with favorable pathologic findings, such as Gleason scores of <7, low PSA density (0.10-0.15), and cancer involving less than 3 of 6 core biopsy specimens or <50% of any core.²⁶ There is less agreement about other factors cited in the literature such as a PSA level of less than 10 ng/ml, and the absence of palpable disease on DRE.²⁷ The American Urological Association specifies only that patients who are best candidates for surveillance are those with a shorter life expectancy and/or a low tumor grade.²⁸ Published criteria for patient selection do not consider other critical variables affecting the decision: the patient's and his partner's attitude, and their overall tolerance of uncertainty.

"We know little about the attitudes of prostate cancer patients and their spouses toward expectant management, nor of the process by which they arrive at a treatment decision."

Patient and Partner Views of Expectant Management

We know little about the attitudes of prostate cancer patients and their spouses toward expectant management, nor of the process by which they arrive at a treatment decision. That information is critical in light of the controversy and scientific ambiguity about which treatment—if any—is best. Several studies have suggested that the "watch and wait" option is viewed negatively in American culture,^{29,30} and some have speculated as to why this viewpoint is held.

Using hypothetical case scenarios, Mazur and Merz²⁹ asked 148 male patients (aged 30-85) at a Veterans Affairs Medical Clinic whether they would choose surgery or expectant management for localized prostate cancer. None actually had prostate cancer, but they responded to hypothetical scenarios presenting various treatment options and expected survival benefits along with defined sets of complications. Surgery was chosen by 43% of men, even when there was no expected survival benefit and associated morbidity

was high. Unfortunately, this study suffers from some inherent biases. The age range of participants (30-85 years) was broad, and it is likely that younger men viewed potential side effects such as impotence and incontinence differently from older men. The presentation of the expectant management scenario was biased, being depicted as only delaying inevitable intervention and presupposing that symptoms would appear and need yet more decisions on the part of the patient. Nonetheless, the study implies that patients may have a strong bias toward surgery as the preferred treatment for prostate cancer.

To assess how decisions about prostate cancer treatment get made, O'Rourke³⁰ interviewed patients and their spouses, both alone and together. She noted that couples swiftly rejected the idea of expectant management, which they consistently referred to as "doing nothing." They cited the examples of other cancer patients (not necessarily prostate cancer patients) they had known who had "done nothing" and died painful deaths, and of positive role models who were fighters and never gave up (for example, General Schwartzkopf). Their worst fear was that untreated cancer would spread and cause a slow and painful death, and they spoke of the waiting they had already done—the months or years of monitoring rising PSA levels and pursuing diagnosis through numerous biopsies. Both the men and their wives considered "doing nothing" merely an option the urologist was obliged to present for consideration. Patients and spouses emphasized the potential for cure—and minimized the risk of recurrence—in choosing active treatment over "watch and wait." Women tended to favor active treatment at almost any cost because of their expressed desire to prolong their husbands' lives; men gave more consideration to potential treatment-related complications.^{31,32}

Other data suggest that patients over-estimate their survival probabilities and thus tend to pursue aggressive treatment.³³ Mazur & Merz³⁴ found that older patients with prostate cancer were consistently willing to trade adverse urological side effects in hopes of a better 5-year survival. This is a particular concern because, despite the availability of complex decision algorithms intended to guide prostate cancer treatment decisions, health care providers cannot (at present) predict survival accurately.

We cannot overlook sociocultural influences on patients' and spouses' views of expectant management. Older couples may defer prostate cancer treatment decisions to physicians whom they perceive as omniscient. Younger patients may rely on unfiltered sources of information such as the Internet. In O'Rourke's study,³⁰ couples were profoundly

influenced by personal and family experiences with cancer and cancer treatment. Finally, celebrity role-models may influence decisions about cancer treatment, including expectant management. For example, Nancy Reagan's choice of mastectomy instead of breast conservation surgery and radiation therapy had a powerful effect on choices by persons of similar demographic status, as well as those of low income and educational status.³⁵

Protocol for Expectant Management

There are no firmly established clinical guidelines for the expectant management of prostate cancer. Continued uncertainty about the biology and natural course of untreated prostate cancer hampers the establishment of formal guidelines. Pending further research, clinicians must be guided by local standards of care, clinical judgment, and collegial consensus rather than by evidence-based medicine. Because of this, we can anticipate significant geographic variation in how patients are advised and followed.

The protocol used in PIVOT requires that patients be seen every 3 months for the first year and every 6 months thereafter. At each visit urological symptoms and both disease-specific and global quality of life are measured. Physical examination and DRE are carried out, and PSA is measured at each visit. All patients are given an annual bone scan.²⁰ Some sources³⁶ say only that "careful observation and monitoring" should take place every 3 months, but they give no specifics about what should be done at each of these visits. There are no published guidelines about when patients should be re-biopsied, and the cost-effectiveness of annual bone scans has been questioned.

One clinical protocol for men who have less than 10-15 years of life expectancy and a normal-for-age PSA is to perform DRE and measure PSA every 3 months for one year, then every 6-12 months thereafter. If the DRE changes or the PSA increases at a rate of >0.75 ng/ml per year (or >50% of the initial PSA level per year), re-staging is carried out with bone scan and prostate biopsy guided by transrectal ultrasound (TRUS). Treatment thereafter is based on clinical stage, patient age, comorbid illness, and personal preferences. Other protocols monitor PSA, DRE and TRUS every 4-6 months.

There are a number of instruments of established validity and reliability available for assessing quality of life in prostate cancer patients. It is essential to use such measures at each follow-up visit and to instruct patients and partners to report promptly any changes in symptoms. It is also useful for

"Older couples may defer prostate cancer treatment decisions to physicians whom they perceive as omniscient. Younger patients may rely on unfiltered sources of information such as the Internet."

patients to have their PSA levels measured in advance of their visit so the results can be reviewed, and questions and concerns be addressed during the visit.

When Should Active Treatment Be Pursued?

Active treatment with hormonal manipulation should begin when patients who have chosen expectant management experience bothersome symptoms. Hormonal therapy is not used early because it is usually efficacious for only 2-3 years.³⁷ Patients who are not candidates for surgery or radiation therapy but who are psychologically intolerant of "no treatment" may need early hormonal manipulation. This has been a common approach in some countries.³⁷

A number of studies have tried to use PSA as a biological marker of prostate cancer disease activity. Carter and colleagues³⁸ found that the rate of increase of PSA was greater (0.75ng/ml/year) in men with prostate cancer than in men with benign prostatic hypertrophy (BPH) only. However, once diagnosis is established, it is not certain what rate of change in PSA is significant enough to warrant re-staging. The time it takes for the PSA value to double does correlate with disease progression, time to treatment for disease progression, and stage progression,³⁹ but it has yet to be shown to be a more powerful indicator of disease activity than Gleason score, tumor grade, or tumor stage.

The Ordeal of Uncertainty

One of the most distressing aspects of expectant management is the need for patients and their partners to live with continual uncertainty.³⁰ Couples in O'Rourke's study thought that surgery would be curative, leaving no trace of the dreaded malignancy behind. Radiation therapy was viewed as less than curative, leaving lingering doubts of recurrence, and expectant management ("doing nothing") was seen as only delaying needed treatment, and ultimately leading to a premature and painful death. In regard to both radiation therapy and expectant management, couples spoke of the difficulty of "not knowing," and of "always wondering when" the cancer would abruptly change their lives. They were inclined to "get treatment over with" to reduce anxiety. Thus, to make expectant management acceptable and tolerable over the long run, we need ways to minimize the burden of uncertainty.

Research in this area has been sparse, but this is not surprising since expectant management and quality of life

research in prostate cancer are relatively recent developments in the United States. One published study to date has examined the strategies used to control uncertainty by men electing expectant management of prostate cancer.³⁹ Both Bailey³⁹ and O'Rourke³⁰ found that men and their spouses use the psychological technique of "re-framing" to deal with uncertainty. Treatment was re-framed as negative (associated with severe and debilitating side effects) while expectant management was viewed as positive (the optimal choice).

O'Rourke³⁰ noted that men often compared themselves with others who were worse off than themselves and that such comparisons allowed them to view their situation more positively. The use of social comparisons or upward social affiliations has successfully maintained hope and inspiration.⁴⁰ Other strategies include attempts to minimize the

cancer threat by focusing on the small size of the tumor, low Gleason scores, or low PSA values when compared to other men with prostate cancer.^{30,39} Outright denial of the cancer threat took the form of not talking about the cancer and attempting to put it out of one's mind.³⁹

Folk medicine and non-standard treatments play a role. Bailey and Mishel³⁹ noted that some men who opted for expectant management self-medicated with shark cartilage and antioxidants in an effort to "fight" disease and "build up" their immune systems. Perhaps this alleviated some of the anxiety associated with absence of active treatment for their cancer. O'Rourke³⁰ also reported that several men in her sample (one of whom chose expectant management) used saw palmetto and a variety of vitamins, minerals, bee pollen, or black walnut shell oil as supplementary treatments. Prayer has been suggested as a

"In regard to both radiation therapy and expectant management, couples spoke of the difficulty of 'not knowing,' and of 'always wondering when' the cancer would abruptly change their lives."

powerful strategy for dealing with uncertainty, and there is considerable research interest in the use of prayer, especially in coping with cancer.

Support groups can be an effective means of coping with the cancer diagnosis and the sequelae of treatment, although presumably not for those who use denial as their dominant coping strategy. There are a number of local and national support groups available, including the US TOO support group and the Man-To-Man program. A variety of web sites available on the Internet are directed at both patients and their partners, but those who use such sites should be advised about the possible scientific inaccuracy of medical information available there. Regarding alternate treatments and anecdotal information obtained from the Internet or other non-traditional sources, medical practitioners should maintain an open dialogue with patients and their partners.

Cultural and ethnic differences in the perception of

uncertainty have only recently been explored. Germino and associates⁴¹ reported that, while levels of uncertainty were higher in African-American men with prostate cancer from poorer social environments, this uncertainty disrupted their adult role functioning less than it did that of Caucasian men. This may reflect the central role of spirituality in buttressing quality of life, particularly among older African-Americans. Until more is known about cultural and ethnic differences in the management of uncertainty, we must be aware of the possibility of such differences in assessing quality of life.

The needs of patients and their spouses are not always synchronous. Strategies that may help the one may be poorly received by the other. Patients and their partners have a shared history, but they have their own individual histories and coping styles. The "public" coping persona and the "private" coping persona may be quite different. Health care providers must take time to address couples' concerns as well as the concerns of individuals.

Conclusion

Johansson's hypothesis¹¹ that expectant management of early stage prostate cancer is a viable treatment option seems reasonable for men with a low risk of disease progression. Current data indicate that the patients most appropriate for expectant management are those with clinically confined disease, low Gleason scores, and a life expectancy of 10-15 years or less.

Choosing expectant management is a decision fraught with uncertainty. Follow-up recommendations and guidelines about when treatment should be initiated are vague and not geographically uniform. The natural history of prostate cancer suggests men should be expected to live at least 10 years from the time of diagnosis to benefit from attempts at cure, but the decision will be affected by patient age and the presence of other diseases. And if we decide on palliative therapy, even the time when these treatments should be started is controversial. Nevertheless, it seems clear that a subset of patients can be followed expectantly; physicians must work with these men and their partners to develop and maintain strategies for coping with multiple sources of uncertainty if this option is to enhance the quality of their lives. □

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Health Hazards of Pepper Spray

C. Gregory Smith MD, MPH and Woodhall Stopford MD, MSPH

Oleoresin capsicum (OC) is an oily extract of pepper plants of the genus *Capsicum*. Each year, millions of pounds of capsicum are imported into the United States, primarily from India, Japan, Africa and Mexico. It is used as a spice in salsa, chili, curries, and hot sauces; as a pharmacologic agent in topical anesthetic and analgesic creams; and as the principal active ingredient in OC spray, or "pepper spray," used by police and others as an antipersonnel agent. OC extract consists of a complex mixture of fat soluble phenols known as capsaicinoids; capsaicin (*trans*-8-methyl-*N*-vanillyl-6-nonenamide) and dihydrocapsaicin, the most potent homologues, make up 80-90% of the total. Capsaicinoid content determines the "hotness" of the extract. The Table depicts the relative hotness of three popular edible peppers and capsaicin as measured in Scoville units (the greatest dilution of pepper extract that can be detected by the human tongue).¹⁻³

The capsaicinoid content of extracts used in pepper sprays varies widely among manufacturers, from 1.2% to 12.6%. Since the concentration of extract in pepper sprays also varies (5-15%), the potential risks associated with capsaicinoid exposure may vary by as much as 30-fold among brands of OC spray.

Depending on brand, an OC spray may contain water, alcohols, or organic solvents as liquid carriers; and nitrogen, carbon dioxide, or halogenated hydrocarbons (such as Freon, tetrachloroethylene, and methylene chloride) as propellants to discharge the canister contents.³ Inhalation of high doses of some of these chemicals can produce adverse cardiac, respiratory, and neurologic effects, including arrhythmias and sudden death. The health effects of solvents and propel-

lants are beyond the scope of this article, but they too need to be considered in evaluating potential hazards and effects of exposure to specific brands of OC spray.

During the past decade, OC sprays have become popular with law enforcement and corrections personnel as non-lethal deterrent agents. But there is no real scientific basis for the claim that OC sprays are relatively safe. In fact, a number of reports have associated serious adverse sequelae, including death, with legitimate use, as well as misuse and abuse, of these sprays.

Table. Relative "hotness" of edible peppers and capsaicin*

| Source | Scoville heat units (HPLC**) |
|-----------------|------------------------------|
| Jalapeno pepper | 5,000 |
| Cayenne pepper | 2,500-25,000 |
| Habanero pepper | 85,000-200,000 |
| Pure capsaicin | 15,000,000 |
| OC (10%) | 1,500,000 |

*Adapted from Steffee et al³

**high-performance liquid chromatography

In this article, we review the acute and chronic effects of exposure to capsaicin and OC spray, summarize the occupational health risks of exposure to OC spray during training, review actions taken in the state to address these concerns, and present recommendations to prevent unwanted effects as these sprays become more widely used for personal protection, law enforcement, and corrections-related activities.

Health Effects of Capsaicin

The characterization of capsaicin was begun in the 1940s by the Hungarian pharmacologist Nicholas Jancso. From his work and others', we have learned that capsaicin acts directly on peripheral sensory nerves and not on motor nerves. It has

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been used to probe the biologic function of C-fibers and the role of pain receptors (nociceptors) in human physiology. It provides a unique pharmacologic tool for studying the human cough reflex and other airway reflexes. It alters the neurophysiology of sensory neurons in the airway mucosa by inducing the release of tachykinins or neuropeptides like substance P and neurokinin A. These induce neurogenic inflammation in airway blood vessels, epithelium, glands, and smooth muscle, leading to vasodilation, increased vascular permeability, neutrophil chemotaxis, mucus secretion, and bronchoconstriction.⁴⁻⁷

The chemical tear gas agents chloroacetophenone (CN) and o-chlorobenzylidene malononitrile (CS) produce primarily irritant effects, but exposure to OC causes both irritation and neurogenic inflammation. Exposure to OC spray may occur through skin or eye contact, or inhalation. Once inhaled, it can be expectorated or ingested. With acute exposure, there is rapid onset of constitutional symptoms including nausea, fear and disorientation.

The ill effects of OC. Dermal exposure to OC spray causes tingling, intense burning pain, swelling, redness, and, occasionally, blistering (capsaicin alone causes redness and pain, but not vesiculation). A severe dermatitis, called "Hunan hand," is found in people who process chili peppers in Mexico. Capsaicin amplifies inflammation by releasing substance P from the skin and nasal mucosa. Multiple exposures of skin or mucous membranes over a period of seconds or minutes exaggerate the response. Capsaicin augments allergic sensitization and worsens allergic dermatitis. Exposure may diminish sensitivity to heat- or chemical-induced pain, thus increasing the risk and severity of skin burns. Capsaicin powerfully stimulates heat receptors, causing reflex sweating and vasodilation, and activates hypothalamus-mediated cooling; this dual effect increases the risk of hypothermia if victims are decontaminated with cold water on cold days.^{3,7,8}

Respiratory responses to OC spray include burning of the throat, wheezing, dry cough, shortness of breath, gagging, gasping, inability to breathe or speak (due to laryngospasm or laryngeal paralysis), and, rarely, cyanosis, apnea, and respiratory arrest.³

Nasal application of capsaicin causes sneezing, irritation, and reflex mucus secretion.⁹ Its inhalation can cause acute hypertension (similar to ammonia inhalation), which in turn can cause headache and increase the risk of stroke or heart attack. Animal studies show various and sometimes profound reflex effects on respiratory and cardiovascular function. These include apnea, airway edema and constriction, systemic vasodilation, hypotension, bradycardia, and sometimes atrioventricular blockade and even asystole.⁸⁻¹⁰

"Inhalation of capsaicin can cause acute hypertension (similar to ammonia inhalation), which in turn can cause headache and increase the risk of stroke or heart attack."

Respiratory effects. Capsaicin-sensitive nerves play an important role in cough, airway reactivity and inflammation. Like other airway irritants, aerosolized capsaicin stimulates the human cough reflex via sensory nerve endings supplied by afferent, unmyelinated C-fibers.^{10,11} In one study, 13 of 22 chili workers exposed to capsaicinoids complained of rhinorrhea and cough, even at concentrations lower than $1\mu\text{g}/\text{m}^3$.⁴ Another study of hot pepper workers and controls found that inhalation of dilute, nebulized capsaicin caused reproducible, dose-dependent cough in both groups without inducing tachyphylaxis or significant decrease in baseline pulmonary function in either group.⁴ Other studies have demonstrated that capsaicin causes contraction of human bronchial smooth muscle *in vitro*¹² and transient (<1 min) dose-dependent bronchoconstriction *in vivo* (a 20-50% increase in airway resistance at doses that do not induce cough).^{9,13} There was no

difference in duration or magnitude of bronchoconstriction in normal subjects, smokers, and asthmatics; the mechanism has not been clearly elucidated, but it is felt to be mediated either through substance P (acting directly or indirectly) or through vagal reflex bronchoconstriction caused by stimulation of C-fibers.¹³ No cases of occupational asthma due to capsaicin have been reported, and it is important to point out that not all asthmatics are sensitive to its bronchoconstrictive effects.^{3,14}

In addition to precipitating bronchoconstriction, which could manifest as acute asthma, OC spray exposure may increase the risk of laryngospasm and respiratory arrest. Two persons with asthma and one with chronic bronchitis developed respiratory arrest following OC spray exposure during arrest. Respiratory arrest also oc-

curred in another person with a respiratory infection who was sprayed repeatedly.^{3,10,15} Direct contact of capsaicinoids with the vocal cords has caused laryngospasm lasting 45 seconds. In addition, laryngospasm, laryngeal and pulmonary edema, chemical pneumonitis and respiratory arrest have occurred after intentional and accidental OC spray inhalation by children.^{16,17}

In rodents, capsaicin-induced release of substance P stimulates mucus secretion, increases vascular permeability in the lungs, and exacerbates pulmonary inflammation associated with respiratory infection. Capsaicin exposure in the face of respiratory infection may increase vascular permeability 60-fold. Exposure during *Parainfluenza* infection causes a 3- to 5-fold increase in neurogenic inflammation of the airways, and, during *Mycoplasma pulmonis* infection, a 30-fold increase in neurogenic plasma extravasation that may last for several weeks. Unfortunately, there are no similar studies in humans.⁵

Chronic low-dose exposure to capsaicinoids is associ-



Police using pepper spray to control demonstrators. Photo by Bernie Eng, Saginaw News, Saginaw, Michigan.

ated with chronic respiratory symptoms and illness. Chili grinders chronically exposed to *Capsicum* develop rhinorrhea, sneezing, cough, weight loss, burning skin (especially when they sweat), and bronchoconstriction. Symptoms are more severe early in employment and tend to decrease with time or when exposed to pepper plants containing less capsaicin. Paprika workers exposed to capsaicinoids may develop hemoptysis, severe chronic bronchitis, pulmonary fibrosis, and bronchiectasis. The chronic pulmonary effects occur in workers who break open the capsicum fruits and not the grinders, and so the etiologic factor may be a fungus (*Mucor stolonifer*) which infests the fruits.^{18,19} The chronic effects of low-dose inhalation exposure to OC spray are not known with certainty.

Eye symptoms. Common ocular symptoms associated

with OC spray exposure include redness, swelling, severe burning pain, stinging, conjunctival inflammation, lacrimation, blepharospasm and involuntary or reflex closing of the eyelids. In the rat, application of 1% capsaicin to the eye causes neurogenic inflammation and loss of reaction to chemical and mechanical stimuli for up to a week. In humans, superficial anesthesia and loss of the blink reflex may lead to corneal abrasions from contact lenses or foreign bodies. Capsaicin disrupts the epithelial layer of the cornea, so persons with impaired corneal integrity (from exposure keratitis, keratomalacia, or recurrent corneal erosion) are more susceptible to severe ocular effects than those with normal corneas. Ocular exposure to OC should be treated by flushing for at least 15 minutes with water.^{3,7,20}

Gastrointestinal effects. Capsaicin is principally used

throughout the world as a spice. It provides a burning sensation while eating that does not necessarily end in the mouth. Chemical irritation can produce a sensation of warmth along the entire gastrointestinal tract; high doses may cause painful burning in the esophagus, stomach, abdomen, even anus.⁷

Animal and human epidemiologic studies suggest that chronic chili pepper consumption may be involved in a number of chronic diseases and may be a significant risk factor for gastrointestinal malignancy. Chronic oral administration of capsaicinoids to hamsters is associated with liver fibrosis, necrosis, and cirrhosis, and damage to the kidney glomeruli. Humans who eat lots of chili peppers reportedly have an increased risk of liver cirrhosis. Capsaicin irritates the stomach, which increases acid secretion and gastric motility and may cause hematemesis. Chronic ingestion of capsaicinoids and peppers is associated with an increased incidence of stomach ulcers in both humans and animals.^{7,8,21}

Capsaicin is weakly mutagenic in the Ames test, and a co-carcinogen in rats, enhancing gastric carcinogenesis. Ten percent of mice exposed to capsaicin developed duodenal cancer, versus 0% of those not exposed. A study in Mexico found that consumers of chili pepper had a more than 5-fold increase in risk of gastric cancer (age- and sex-adjusted odds ratio of 5.49; 95% CI 2.7-11.1) compared to nonconsumers; high-level consumers had an odds ratio of 17.11 (95% CI 7.8-37.6). In India and other Southeast Asian countries, eating of chili peppers is associated with oral submucosal fibrosis, a precancerous condition of undetermined etiology.^{7,22-24}

A health benefit? Capsaicin may have some beneficial effects. In mice, it produces dose-dependent prolongation of bleeding time and is a more potent inhibitor of platelet aggregation than either aspirin or indomethacin. In Thailand, ingestion of capsicum is associated with increased fibrinolytic activity and hypocoagulability, resulting in higher antithrombin III and lower plasma fibrinogen levels. These may explain the lower incidence of thromboembolic disease in Thai people.⁷

Occupational Risks of OC Exposure

Based on a favorable 1989 FBI report²⁵ and anecdotal reports of safety and efficacy, many law enforcement and corrections agencies chose OC sprays as a "less than lethal" deterrent, alternative to impact weapons and tear gas. OC was alleged to be effective in apprehending persons who, because they were extremely agitated, mentally ill, or under the influence

of alcohol or drugs, might not feel the irritant effects of tear gas, but would be incapacitated by the inflammatory effects of OC. In 1993, however, the US Department of Labor warned that OC spray posed significant health risks to exposed employees, that it could cause unpredictable, severe adverse health outcomes, and that it should not be intentionally sprayed on the skin, eyes, or mucous membranes of employees during training.²⁶

In 1995, additional questions were raised about the safety and effectiveness of OC sprays. A conflict of interest investigation by the FBI Academy Firearms Training Unit in Quantico, VA (which had produced the earlier, favorable report on OC sprays) revealed that one of their researchers had received \$57,500 from the manufacturer and distributor of Cap-Stun, a widely used brand of OC spray. The agent pled guilty to a felony violation of federal conflict of interest law.²⁷

"Because there have been few controlled clinical studies on the human health effects of pepper spray marketed for police use, some physicians have surmised that pepper spray is not inherently lethal or dangerous."

Challenge to training exposure. Some law enforcement and corrections officers began to challenge training policies requiring that they be sprayed in the face with OC to learn its effects. Concern about pain and potential adverse effects led those involved to ask, "We don't need to get shot to know what a bullet does, so why do we have to be sprayed to know what OC does?"²⁸ A challenge to mandatory exposure in North Carolina took the form of a lawsuit seeking an injunction against the NC Department of Corrections, arguing that pepper mace training is "dangerous," extremely painful, and a violation of the right to due process. Lacy H. Thornburg, U.S. District Court Judge for Western North Carolina (who was

North Carolina Attorney General when the policy mandating full exposure to OC spray during training was written), dismissed the case, stating that pepper mace training did not deprive the plaintiff of due process under the 14th Amendment. The decision was appealed, and in 1996 the US Court of Appeals reversed Judge Thornburg's decision.²⁹

In 1996, the Division of Epidemiology of the NC Department of Health and Human Services and the Occupational Safety and Health Section of the NC Department of Labor began an investigation of training practices involving intentional exposure to OC spray. Based on a compliance inspection, observation of a training session, detailed review of various training programs, the medical literature, and Occupational Safety and Health Administration (OSHA) activities outside of NC, they concluded that exposure to OC spray during training constituted an unacceptable health risk. A review of reported injuries found that 61 of approximately 6000 officers directly exposed to OC spray during training

experienced adverse effects (eye irritation, eye burns and abrasions, dyspnea, asthma attacks, nasal irritation, acute hypertension, severe headaches, chest pain and loss of consciousness) sufficiently severe to require medical attention. In 9 cases, effects (headaches, corneal abrasions and asthma) lasted for more than a week. (W Stopford, unpublished data).

NC Medical Society Resolution. In 1997, delegates to the North Carolina Medical Society's Annual Meeting adopted a resolution calling for the NC Commissioner of Labor to send guidelines for the safe use of capsaicin spray to law enforcement organizations, the Secretary of the NC Department of Crime Control and Public Safety, and the NC Attorney General. In April 1998, Dr. Ronald H. Levine, then State Health Director, and Harry Payne, the Commissioner of Labor, sent an advisory letter outlining the health and legal concerns associated with the use of OC spray, and recommending that exposure during training be discontinued. The advisory further outlined several measures to reduce the chance of serious injury, should organizations choose to continue exposure training. These included (1) substituting indirect exposure (spraying a wall faced by the trainee or spraying above the trainee's head) or wearing face shields or chemical goggles if direct exposure is used; (2) providing emergency showers and eyewash stations; (3) screening employees to identify and exempt from exposure those with health conditions that might be exacerbated by exposure to OC spray; (4) having medical personnel present during training to render first aid and other medical treatment if necessary; and (5) compliance with OSHA's Hazard Communication (29 CFR 1910.1200) and Personal Protective Equipment (29 CFR 1910.132) standards during each OC spray training course.³⁰

Discussion

Serious adverse health effects, even death, have followed the use of OC sprays. These sprays should be regarded as poisons or weapons and kept away from children and teenagers.¹⁷ The risks of OC spray use by adults for self defense has not been studied, and its effectiveness as a crime deterrent is unknown.

The dangers. Hot peppers and sauces have been agents of child abuse⁷ and OC spray has been used in a juvenile detention center for corporal punishment and psychological control. Use of OC to inflict pain is abusive and may cause emotional sequelae.³¹ At least one court has ruled that pepper spray should be used only when absolutely necessary to incapacitate dangerous youth "in situations which are reasonably likely to result in injury to persons or injury to a substantial amount of valuable property."³²

Historically, Japanese police used the *metsubishi*, a lacquer or brass box, to blow pepper dust into the eyes of

persons they sought to apprehend.³ Today, more than 2000 public safety agencies now use some form of pepper spray to subdue and arrest aggressive and violent persons.³¹ Law enforcement publications suggest that most who are sprayed suffer relatively minor, transient effects, and that serious adverse effects are uncommon.

Because there have been few controlled clinical studies of the human health effects of pepper spray marketed for police use, some physicians have surmised that pepper spray is not inherently lethal or dangerous.³³ A retrospective review of 81 cases of OC exposure seen in the emergency department of Truman Medical Center, Kansas City, MO, and representing about 10% of total instances of spraying by the Kansas City Police Department over three years, found no significant ocular or pulmonary effects. Burning and redness of the eyes and exposed skin were the most common symptoms; there were corneal abrasions in 7 and respiratory symptoms in 6 patients, but none required hospitalization. Interestingly, 12 of the 81 had a history of asthma, but their respiratory symptoms were similar to the other 69. Five patients presented with shortness of breath or wheezing; 2 had a history of asthma (their wheezing resolved without treatment), and 3 had no apparent predisposing factors (and also did not require treatment).³⁴

Despite the encouraging findings from Missouri, since 1993 over 70 in-custody deaths have involved the use of OC spray during arrest efforts.² A review of 30 such deaths occurring in 13 states³⁵ and another of 26 deaths occurring in California¹⁵ found that positional asphyxia (usually associated with hog-tying the arrestee), drug intoxication (with ethanol, cocaine, methamphetamine, or phencyclidine), pre-existing cardiovascular or respiratory disease, obesity, neuroleptic malignant syndrome, and other conditions caused or contributed to almost all deaths. Exposure to OC spray was not judged to be a precipitating cause in any case, but its use before death was not mentioned in 10 of the California cases, and there is concern that its potential role was not adequately considered in some of the others.

A 1993 death in North Carolina (a 24-year-old man with pre-existing florid bronchiolitis/bronchitis and cardiomegaly found at autopsy) was attributed to "asphyxia due to bronchospasm precipitated by pepper spray" by the attending pathologist and the NC Chief Medical Examiner. This highly publicized and controversial case and another involving, but not attributed to, OC spray have been presented in an article that details the pathologic, toxicologic, and other evidence needed to establish whether OC spray is unrelated, contributory, or causative of death in such cases.³

Avoiding unnecessary exposure. Many law enforcement and corrections agencies now prohibit the practice of spraying trainees directly in the face with OC. Based on reports of ocular damage, bronchospasm, pulmonary edema, laryngospasm, respiratory arrest, and death following OC expo-

sure, it is reasonable to conclude that exposure during training, particularly repetitive, direct facial spraying of individuals at increased risk, may cause serious adverse effects and possibly even death. Occupational exposure during training is not advised, and those organizations that continue to use OC spray should avoid direct exposure and screen out and exempt entirely all employees at increased risk for adverse effects (those with pre-existing allergies to peppers, with corneal disease, hypertension, heart disease, respiratory infections, bronchitis, asthma or a history of airway reactivity following irritant exposures, and cigarette smokers). Some people, such as instructors in law enforcement, may have repetitive, low dose exposure to OC spray, but the effects of such chronic exposure are unknown.

The proper role of OC. Despite training-related hazards, field-use data by police departments in Baltimore, Portland ME, and Winston Salem indicate that properly used OC can be effective and provide additional safety to enforcing officers. In many instances it may reduce injuries to officers as well as to arrestees (such as fractures, traumatic brain injury, or gunshot wounds, which sometimes result when physical force or impact weapons are required). The use of OC may thus lessen complaints about use of excessive force, and civil liability and injury-related costs to governmental agencies. We believe that OC spray should remain in the armamentarium of law enforcement and corrections officers who

ultimately must decide, based on standard operating protocols, when and which deterrents ought to be used in a given situation. It is important to remember that subjects who are highly aggressive, agitated, intoxicated, or suffering from mental illness may have altered perception of and response to pain, and consequently may not be affected by—or may even become enraged after—being sprayed. When OC spray is used, officers must decontaminate those sprayed as soon as possible, continuously monitor them for evidence of serious adverse effects, and seek medical attention immediately if potentially life-threatening symptoms develop.²⁸

The Consumer Product Safety Commission regulates the labeling of OC spray as a hazardous substance under the Federal Hazardous Substance Act. A prominent and conspicuous warning stating the principal hazard, precautionary measures to take when using the product, and first aid measures to be used should appear on the spray. These sprays can be readily purchased via the Internet, and most states place little or no restriction on their purchase. Many buyers do not know enough about the potential hazards of accidental or deliberate misuse and most never receive any training other than the most primitive instructions ("Point and spray!"). Anecdotal, research, and clinical data on the adverse effects of OC sprays are now sufficient to say that the hazards of these products ought to be more objectively and thoroughly evaluated and more clearly communicated. □

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Should Men Be Screened for Prostate Cancer?

by Sushma M. Patel, MD

Prostate cancer is now the most common cancer of American men. In 1999 alone, we will have an estimated 179,300 new cases in the United States. Prostate cancer will account for 29% of all new cancers found in men.¹ In North Carolina, there will be an estimated 5400 new cases. We do not know all the reasons for the increasing incidence of prostate cancer, but at least one reason for the increased rate of diagnosis is more aggressive screening using the prostate specific antigen (PSA) blood test.

It is a general rule of screening tests that they should be easily performed and should lead to early detection of treatable disease. Routine screening for some cancers has decreased the associated rates of death or disability. For example, mammograms and Pap smears are two screening tests that allow diagnosis of breast cancer or uterine cervix cancer at a stage of disease when aggressive treatment is able to cure patients.

To Screen or Not To Screen

Currently, there is controversy about whether men should have routine prostate cancer screening. The United States Preventative Services Task Force does not recommend screening with either the PSA blood test or the digital rectal exam (DRE), a test that can allow a doctor to feel some prostate cancers. On the other hand, the American Cancer Society and the American Urologic Association currently recommend screening with both PSA and DRE to begin at age 50 for men without symptoms and at age 40 for men at high risk. Men at high risk are those with a family history of prostate cancer and African-American men. Both groups are susceptible to a more aggressive form of prostate cancer.

The controversy in recommendations exists because, while prostate screening can detect cancer, early detection has not yet been proven to decrease mortality. That is, it is not clear that finding prostate cancer early—before it produces symptoms—prolongs life. There is still much uncertainty about the natural history of prostate cancer and about the variations in its clinical aggressiveness. Up to one-third of patients who have prostate cancer never manifest clinical symptoms from the disease. Therefore, there is probably a set of patients who will not benefit from aggressive treatment; such treatment will not prolong their lives but may diminish the quality of life by producing side effects. PSA screening to detect early-stage disease appears least likely to benefit patients who have a life expectancy of less than 10 years or patients who are older than 75 years, because most such patients do not die from their prostate cancer, but from other causes.

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What is PSA?

PSA is a protein secreted into the blood stream from the prostate gland. It is easily and accurately measured in a blood sample. The results of the PSA test are expressed as ng/ml, meaning nanograms (of PSA)/milliliter (of blood serum). Most men with no prostate disease have PSA levels between 0-4 ng/ml, but the actual values vary with age (see Table). PSA levels can be above normal for many reasons, some of which include benign prostatic hypertrophy (the age-related enlargement of the prostate experienced by most men), prostatitis (inflammation of the prostate), and prostate cancer.

It is important to emphasize that an elevated PSA level does *not* necessarily indicate cancer. After finding an elevated level, part of the doctor's job is to decide—if possible—the reasons for the elevation. Just as the "normal range" of PSA increases with increasing age, so does the incidence of prostate cancer; in fact, 80% of prostate cancers are found in men older than 65 years of age. Normal range merely provides an age-adjusted guideline as to the levels of PSA that in general should be investigated further, but in any individual there are many other factors that need to be considered by both patient and doctor.

Table. Age-specific PSA ranges.²

| Man's age in years | Normal PSA values |
|--------------------|--------------------|
| 40 to 49 | 0 to 2.5 ng/ml |
| 50 to 59 | 0 to 3.5 ng/ml |
| 60 to 69 | 0 to 4.5-4.9 ng/ml |
| 70 to 79 | 0 to 5.8-6.5 ng/ml |

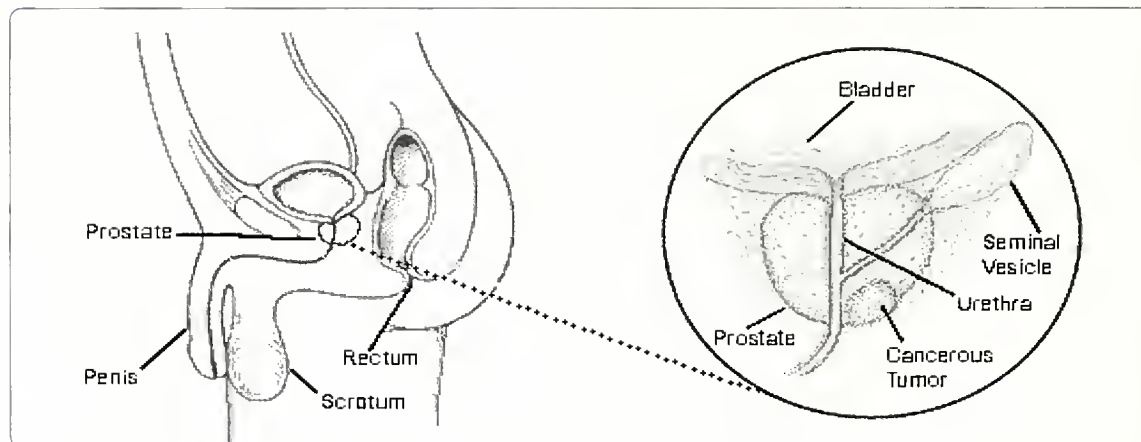


Figure. Anatomy of the Prostate Gland. Reprinted by permission of the American Cancer Society, Inc.

Acting on Abnormal Test Results

If a patient has an abnormally elevated PSA or abnormal DRE, most doctors recommend biopsy of the prostate gland (unless there is some other evident explanation for the abnormal results). Biopsy means taking some prostate tissue using a needle inserted into the prostate through the rectum (see Figure above). An ultrasound probe is used to guide

placement of the biopsy needle. Usually six samples are taken, three from each side (the right and left lobes) of the prostate gland. A pathologist examines the samples through a microscope to determine if cancer is present. Once a cancer is identified, radiographic tests such as CT scan and bone scan are recommended to discover if the cancer is confined to or has spread beyond the confines of the prostate gland. Treatment options are based to some extent on whether the cancer is confined or not.

There are several treatments available for prostate cancer, including surgical removal of the prostate gland, radiation therapy, and various kinds of hormone manipulation. All forms of treatment have advantages and all have disadvantages, but a discussion of treatment is beyond the scope of this paper. A number of factors beside a determination of whether the cancer has spread can help doctors and patients in the process of deciding whether treatment is indicated at all, and if it is, then what kind. These factors include the level and rate of rise in PSA levels, determination of the apparent degree of malignancy on the biopsy specimen, and the Gleason score.

What Will the Future Hold?

Even after taking into account all the known factors influencing the clinical course of prostate cancer, there remains a group of patients who will never manifest clinical symptoms from the disease nor have their life shortened by the cancer. Until the benefits of treating—or not treating—prostate cancer are evaluated by a randomized, prospective clinical trial, routine screening of men for prostate cancer will remain controversial. Such a randomized trial is now under way to determine the benefits of screening for prostate and other cancers. The Prostate Lung Colorectal Ovarian screening trial sponsored by the National Cancer Institute offers screening for these cancers to men and women between the ages of 55 and 74. This trial will ultimately help to determine whether early detection by PSA and DRE will decrease the rampant mortality of prostate cancer. Until the results of such trials are available, the decision to have a PSA or DRE screening will be an individual one, made by patients after discussing with their physicians the risks and potential benefits of testing.

¹Landis SH, Murray T, Bolden S, et al. CA Cancer J Clin 1999;49:8-31.

²Oesterling JE, Jacobsen SJ, Chute CG et al. JAMA 1993;270:860-4.

Breast-Conservation Treatment



AT LEAST ONE-THIRD OF ALL BREAST CANCER PATIENTS COULD HAVE LUMPECTOMY FOLLOWED BY RADIATION THERAPY

The American Cancer Society, the American College of Surgeons and the American College of Radiology have agreed that women whose early breast cancer was detected by mammography are candidates for breast-saving treatment. This treatment consists of lumpectomy with axillary node sampling followed by radiation therapy to the breast. According to new standards, women with small lumps, those with tumors as large as two inches, and even some women with positive nodes may be candidates for this treatment.

The purpose of the breast-conserving treatment is to treat these patients adequately but with a good cosmetic result. Stage for stage, patients treated in this manner have the same longevity and the same freedom from local recurrence as those treated with mastectomy.

For copies of the standards please contact Keri Sperry, American College of Radiology, 1891 Preston White Drive, Reston, VA 22091.



Short Circuits in My Brain

A Personal Report

Theresa M. Sull, PhD

"I can't bring you into focus," I told my husband. "It's strange. There are two of you." I was seeing Gene out of the corner of my eye from a prone position, my head still on my pillow. He was standing next to the bed, and I twisted a bit to the left and then to the right, trying to pull his two faces together. When I stood up I could see clearly, but not—it seemed—when I was lying down. As the day went on an odd pattern became clear. When I tried to make a left-hand turn onto a busy street, I couldn't tell how close the oncoming car was, or whether there were actually two cars in adjoining lanes. I hardly dared pull out into traffic. Then I realized that my double vision was related not to body position, but to what I was focusing on. Looking to left or right, using peripheral vision, I saw double, but looking straight ahead, my vision was fine. I made an appointment with my eye doctor!

I underwent a lengthy examination that included a test of my field of vision. Wearing an eye patch, I had to peer at a screen and press a button whenever I saw a blinking green light. The accompanying beeps made the experience something like a video arcade game. I did have diplopia—double vision—but the doctor didn't see any nerve damage when she studied the backs of my eyes using the small bright light of her ophthalmoscope.

"You probably have a virus," she concluded. "Sometimes we see these mysterious viruses, but we don't know why. They last about a month. Make another appointment if the problem doesn't go away."

My double vision did disappear within the month. At the beginning of January, 1998, I began my second semester as a professor of child development at a local state university, blissfully unaware that I'd just seen the fourth physician who had not recognized my dangerous neurological symptoms.

At my last two annual physicals I'd told my family practitioner that I felt tired all the time, but that must be the most common complaint that doctors hear. "I used to be able to run a mile or two," I said, "but now I can hardly manage to walk a few blocks. When I jog, I can barely lift my legs and they feel achy. I'm exhausted when I go to sleep, and when I wake up in the morning I'm still tired."

My mother had recently been diagnosed with a thyroid problem, so the doctor ordered blood tests, but I didn't have a thyroid problem or low iron. My diet seemed fairly healthy. The doctor just urged me to get more exercise and to reduce job-related stress. Easier said than done! As a new assistant professor I expected to work hard, but the course load I was carrying would have overwhelmed a new professor in the best of health—and I was much sicker than I suspected.

I am at the age when I could expect perimenopausal symptoms, such as lack of energy or mood swings, and dysthymia, with occasional episodes of clinical depression, is something that I have battled since I was in high school. With therapy and medication, I have managed to keep my mood generally stable. My family life and my career have both flourished. My husband of 25 years and I were exceedingly proud of our two daughters because, given my mood disorder, it had required a lot of awareness and hard work on both our parts to raise them well. Our oldest, the dancer, was looking at colleges and our youngest, the writer, was in middle school. They were lovely, healthy, well-balanced children. Recently I had earned a doctorate in educational psychology and was earning my highest salary ever. I should have been on top of the world, but for two years I had felt myself sinking lower and lower.

Sleep That Does Not Restore

"I get home from work and I go right to sleep. I'm napping several afternoons a week," I told my psychiatrist. "I struggle

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through the work week and then on weekends I do absolutely nothing. I just sit around and sleep a lot, then I'm even further behind when Monday comes. I feel like I'm slogging through molasses. Just staying alive, just doing the necessary everyday tasks, is such an enormous effort."

We tried new antidepressant medications, starting with extremely low doses because I'm very sensitive to drugs, but each time we got the dosage to a level where I might feel some benefit, I developed troubling side effects such as tingling in my legs and mouth. One night the tingling sensation was so irritatingly uncomfortable that I got out of bed and danced up and down in the living room, unable to sleep, unable to be still for even a minute.

Convinced that my depression was getting worse, my psychiatrist sent me to a psychopharmacologist at the hospital. I got a prescription for two medications—one for anxiety along with an antidepressant. The doses were very low since each drug seemed to make the other more effective. My mood didn't exactly lighten, but I continued to cope. Neither doctor suspected that my fatigue and my feelings of weakness were anything but depression.

At the end of an exhausting semester I agreed to teach a summer session course. The department was short-staffed and I was worn to the bone, but after teaching five courses, one course—even one that lasted three hours, five days a week—sounded like a piece of cake. I managed to teach the course, but accomplished nothing else for five weeks. Writing on the chalkboard, I would sometimes notice that my left arm was bent at the elbow and I was unconsciously clenching my fist. Standing at the podium, lecturing to the class one day, I realized that I was tipping over to the left, tipping like a bowling pin. I had to put out my leg to catch myself from falling. The students might have thought I'd been drinking.

After work I had no energy left. I took a nap almost every afternoon, sometimes for two to three hours. Stepping out of the shower in the evening, I sometimes swayed—was this merely fatigue?—and reached out to touch a wall before I fell. My mother flew in from Cleveland to help with my older daughter's high school graduation. Without her help, I could never have pulled off the super celebration we had in June under a tent in our backyard by the Eno River.

Seeing Double at 65 MPH

On the way home from dropping my mother at the airport, my diplopia returned. For two days I had noticed a little difficulty

with focusing, but I never expected that my vision would deteriorate so quickly. At 65 miles an hour, in heavy traffic on the interstate near the airport, everything became blurred. Suddenly, all the traffic in front of me, the cars and trucks and white lines, were sliding over and into each other. But this time, not only my peripheral, but my forward vision was involved. With my left hand over my left eye, I managed to exit the highway; I slowly drove home with one eye closed. Even in my own house the double vision was very disorienting.

My eye doctor's office was already closed for the day, so I phoned my family physician. The nurse told me to call the neuro-ophthalmologist at the hospital and, if I could not speak with him, to take myself to the emergency room. The receptionist at the eye clinic said to come to the hospital the next morning, no appointment necessary. I was beginning to understand that double vision might mean something more serious than a virus.

Luckily, my older daughter was able to drive me to the hospital and take me by the arm as we walked across the parking lot and up the stairs. The university hospital is a prominent research and teaching institution, so I put a lot of faith in the staff, but the visits tend to be long because I am often examined by several people, some of them students. This time, I had the kind of eye exam you might have in a dream. One person after another shone bright lights into my eyes, had me follow the moving finger, had me close one eye and then the other, look up, look down, look at the screen, put drops in my eyes, asked what I could see and what I couldn't see. Finally, I had to walk across the room and then stand with my feet together and my eyes closed. I soon felt myself sway and was glad there was a doctor at each elbow to steady me.

The diagnosis was sixth cranial nerve palsy. The messages sent by my brain through that particular nerve weren't being received by a muscle that helps control eye movements; my eyes were not working in synchronization. A very young doctor told my 18-year-old daughter, somewhat prematurely I thought, that I might have MS (multiple sclerosis). I was to have a magnetic resonance (MRI) brain scan as soon as possible. Meanwhile, the optician would fit a plastic prism over one lens of my eyeglasses to correct my double vision. This device allowed me to drive when necessary, but it hardly perfected my vision. My right eye seemed to be looking through a hazy gray cloud.

Before the exam I hadn't connected my vision problems with my rare loss of balance, but I wasn't entirely surprised by the suggestion of MS. Years ago, two of my second cousins had been diagnosed with this debilitating and often

"At 65 miles an hour, in heavy traffic on the interstate near the airport, everything became blurred. Suddenly, all the traffic in front of me, the cars and trucks and white lines, were sliding over and into each other."

crippling disease, and when I lost my balance a few times in the bathroom, I fleetingly wondered if this was how MS felt in the beginning.

Into the MRI, Then Out of Town

Having an MRI was even more like an arcade game than the field of vision test, only this time I felt as though I myself were inside the video game. Loud beeps and buzzes of irregular duration bombarded my ears, punctuated by the attendant's soothing voice over the microphone saying, "This next test will last fully two minutes," and reminding me to keep very still. Claustrophobia has never been a problem for me, but I was so concerned that I might move my head that I had to remind myself to breathe. Conscious of every breath, I felt like I couldn't get quite enough oxygen.

The results of the MRI would not be ready for two days, and we were scheduled to take off on our family vacation, a road trip through the Hudson Valley in New York State. The doctor encouraged me to carry on with my normal life and just call him from the road to get a report. Positive thoughts came with the return of normal vision the very afternoon of the MRI. Maybe my nerves had been reconnected by the bombardment of the magnetic field, the way a lamp can flicker on when you jiggle the cord. I was reminded, however, that in other ways my body was not functioning normally. Climbing hills or stairs took great effort, and once, when I bumped a suitcase in the motel room, I lost my balance and hit the floor.

Reaching a specific doctor at a busy hospital is tricky under the best of circumstances, but it can be significantly more challenging from a series of pay phones. Finally, during a summer thunder storm that rolled out of the Catskill mountains onto the main street of New Paltz, New York, I heard the doctor's words, almost drowned out by the splashing cars and the rain drumming on the glass of the booth: "We can see white matter near the ventricle suggestive of MS." As soon as I returned from New York, I was to have a complete neurological examination at the hospital.

I was more shook up by the results of the MRI, ominously delivered against the background of thunder in a downpour, than I had been by the young doctor's prediction of MS. Always one to prepare myself for the worst, I guess I had expected to hear that things were not so bad after all. But now I remembered that before my grandmother died she had experienced crippling contractions of her limbs. Her diagnosis was Alzheimer's disease, but could she have had MS?

The next stop on our travels was a large bookstore. I was surprised, or maybe dismayed, to find that books on multiple

sclerosis took up a whole shelf. I limited myself to \$50 worth. Never subject to motion sickness, I'd always read on long trips. This time I passed up the dramatic vistas of the majestic Hudson in order to learn more about MS and what my future might hold. The more I read, the more convinced I became that I did have multiple sclerosis. I read snatches aloud to my husband as he drove. "If I had to have a disease," I told him, "at least I picked an interesting one."

Coming to Grips with Diagnosis

Scientists are still puzzled by MS. Opinion has it that a viral infection triggers an auto-immune process, but no one is really sure what causes the illness. Heredity, geography, and even keeping a pet dog have been implicated. The course of

MS in an individual is unpredictable, although over time a benign or episodic course will be distinguished from a more severe chronic-progressive course.

Symptoms may indicate which area of the nervous system is affected: spinal cord, brain stem, optic nerve or cerebrum. The tingling, buzzing feelings in my feet and legs were called paresthesias. The weakness in my arms and legs meant damage to my spinal cord. My double vision and my occasional loss of balance suggested that my brain stem or cerebellum was involved. The loss of equilibrium after a warm shower was explained by the fact that heat often makes the symptoms of MS temporarily worse.

"Remember when my right eye got blurry for a few days and I stopped wearing my contact lenses because I thought they were the problem? It sounds like I was actually having one of the most common early symptoms of MS, an attack of optic neuritis."

I believed that I even had the fairly rare symptom called dysarthria, an inability to pronounce words normally. This was very subtle in my case, but I recognized it, and my hunch was confirmed when my daughters began to make fun of my mispronunciation of phrases like "the Lilith Fair."

And the fatigue. The FATIGUE. The most commonly reported symptom of MS, fatigue often gets worse in the early afternoons, explaining my many naps.

By the time we returned from our trip, I was prepared to hear the neurologist tell me that I probably had MS, but I was unprepared for the number of tests that I would undergo to try to confirm the diagnosis. Between July and October I had three MRIs and a magnetic resonance angiogram (looking for signs of a stroke); a painful lumbar puncture, or spinal tap, to look for abnormal proteins in my spinal fluid; an evoked potentials test, in which many electrodes were pasted to my scalp and to more tender areas like my ankles and behind my knees; and of course the neurological examinations, which

"I read
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interesting
one.'"

involved tapping to elicit reflexes and the placement of a vibrating metal fork on my hands, knees, and feet to test sensation.

Adding to the Puzzle

I donated many, many vials of blood to search for illnesses both common and rare, such as lupus, myasthenia gravis, encephalitis, Lyme disease and, of all things, syphilis. One of these blood tests was significantly abnormal. The level of Vitamin B₁₂ in my blood was around 100 and the normal level was between 200 and 1000. Because my diet included plenty of the foods rich in B₁₂ like meat, eggs and dairy products—I even love liver—it was likely that my body could not absorb the vitamin, a condition leading to pernicious anemia. Off to the bookstore to do more research.

I had thought that “pernicious” meant something like “chronic,” but it actually means “deadly.” If untreated for more than three years, I read, pernicious anemia can cause the brain stem to break down. Some strict vegetarians may wind up with a deficiency of B₁₂, but most people with pernicious anemia lack a protein called “intrinsic factor” which promotes absorption of the vitamin. Lack of vitamin B₁₂ also leads to megaloblastic or enlarged red blood cells that can’t do their job.

Treatment was simple. I would need deep muscle injections of vitamin B₁₂ daily for a week, then once a week, then every other week, and finally once a month on a maintenance schedule to keep a normal level of B₁₂ in my blood. Changing my diet or taking vitamins orally wouldn’t suffice, so I would need injections for the rest of my life. I also would need to be alert for changes in my digestion or elimination because an increase in gastric cancer is associated with the condition.

Doctors look for pale fingernails when they are diagnosing pernicious anemia. I hadn’t realized just how white my nails were until I started receiving the injections of vitamin B₁₂. Over the next few weeks, a white crescent began to stand out as a widening pink band crept up from the base of my nails to the tips. The frequent stops at the doctor’s office for shots would be a minor inconvenience if I could prevent further damage to my brain, but what of the demyelination that was already evident on the MRI, the white spots scattered across my scans like the first sprinkling of snow on a mitten?

It was once believed that nerve cells were the only type of body cell that can’t heal itself, but remyelination can occur, albeit slowly and on a limited scale. With the involvement of long nerve cells that linked my brain and my spine all the way to my toes, I could expect the healing process to take

fully a year to eighteen months.

What a relief! Pernicious anemia wasn’t curable, but unlike MS, it was treatable. The treatments for MS—injections of steroids or beta interferon—might slow down but would not stop the demyelination. But if the problem was B₁₂ I could stop the process, right?

Maybe. Maybe not.

The doctors couldn’t say that I didn’t have MS as well as pernicious anemia. The neurologist merely downgraded my diagnosis from probable to possible MS and said that maybe I had both problems, since my symptoms and brain scans didn’t exactly match either diagnosis. At age 47, I was older than the typical newly diagnosed multiple sclerosis patient and younger than the typical pernicious anemia patient.

I definitely had a demyelinating disease, but maybe it was not due to MS. Only time would tell. I would have to wait patiently to find out what the B₁₂ injections would do. I would have to remain alert for future flare-ups of neurological symptoms, in case it was MS. If I developed pain in my eyes or other visual problems, I was to get to the hospital quickly for steroid injections that might hold off future attacks of MS for a year or more.

More Mystery

The atypicality of my neurological system was further demonstrated by a strange symptom that showed up after I began the B₁₂ treatments. Undressing one evening, I noticed a little white flake on my right nipple.

Aware of the symptoms of breast cancer, I automatically checked my breasts for any discharge. I thought I was being overly cautious, but I already had two good friends with the diagnosis. I was shocked, to say the least, when an avocado-colored fluid seeped out of both my breasts. Thankfully I was sure that it wasn’t a sign of breast cancer because that never shows up in both breasts at once, but what in heaven’s name could be wrong with me now?

My gynecologist took a culture of the fluid and a blood sample. Galactorrhea, the spontaneous flow of breast milk, can indicate a high level of the hormone prolactin, a product of the pituitary gland. Once again I went to the hospital for tests.

The mammogram didn’t show any cancer, although it did pick up a calcification that would need to be rechecked in six months. My prolactin level was 127, high enough that my doctor ordered another MRI to look for a tumor in my pituitary. Meanwhile I started taking a medication that mimics the activity of dopamine in my brain. I was told to stop taking the combination of medications I was using to control my depression because these drugs can impair dopamine

"...but what of the demyelination that was already evident on the MRI, the white spots scattered across my scans like the first sprinkling of snow on a mitten?"

activity and, in very rare cases, they can cause galactorrhea.

The MRI showed no pituitary tumor, but once again plaques suggestive of MS showed up. When my prolactin level fell to the unusually low value of 1, I stopped the dopamine-like medication and once again began the search for an antidepressant without dangerous or troubling side effects.

Questions with No Clear Answers

My year-long medical odyssey seemed to have raised more questions than it answered. Could my extreme sensitivity to antidepressants be a reflection of my other neurological symptoms? Depression certainly has a neurological basis, and some antidepressants work by improving the brain's ability to use the neurotransmitter serotonin. For years I'd assumed that my tendency to depression had been inherited from my father who had displayed symptoms of bipolar disorder. Now I wondered if my lifelong mood disorder was somehow related to my present demyelinating disorder.

Just how many of my problems could be attributed to genetics? Pernicious anemia and multiple sclerosis are both more common in individuals of Northern European origin, and my mother's family was from Poland. Not only did I have second cousins with MS, I found out that a first cousin, just a few years older than I, had pernicious anemia. My mother added that her uncle had experienced problems lifting his legs many years ago and had been given weights to wear to improve his walking. Still another cousin told me of her long standing fatigue and sore feet and legs.

Was an environmental factor involved? My cousin and I had spent much time with our grandmother and grew up together in a double house. Now we both had pernicious anemia (and I began to suspect that lack of B₁₂ was responsible for our grandmother's final illness). The fact that people with the lowest levels of B₁₂ have a high risk of developing Alzheimer's seemed another clue.

Both pernicious anemia and MS are auto-immune disorders, as are thyroid problems—which affected my mother, her sister and her aunt—and asthma, which another cousin reported. My family physician, struck by the high incidence of auto-immune disorders in our family, began to refer to my problem as a familial leukodystrophy, a group of genetically determined diseases that result in degeneration of the white matter of the brain. We had many different diagnoses in the family, but could there be one underlying genetic factor?

As for the future, doctors are unwilling to give me any prognosis. As a worst-case scenario, I have the example of a cousin who spent much of his adult life in a VA hospital, increasingly paralyzed and ultimately confined to bed by MS. Or I see the cousin who recently had her stomach removed because of a cancer that was probably related to her inability to absorb B₁₂.

Where has my journey taken me? Certainly, I have gained a new appreciation for the critical role of vitamins in basic good health. I now take a multivitamin supplement and additional vitamin E. Six months after I began regular injections of B₁₂, my neurological symptoms are decreased. I do not have any vision problems and the ophthalmologist reports that he has to look hard to see a residual nystagmus and a slight atrophy of my right optic nerve. The soreness is gone from my legs and feet, and the pins-and-needles feeling comes much less often and is less strong. I may feel like I almost lose my balance a couple times a day, but now I can take hot showers without starting to sway. Once in a while my knees feel as though they might buckle, but I haven't fallen lately. I'm still napping a lot, but a few times a week I have enough energy to last all day.

My stamina is improving although not steadily. Some days I can complete what used to be my regular two and a half mile walk, but sometimes I begin to feel wobbly and drag my feet near the end, with a sort of MS-like clomp and shuffle. After exercise my feet and legs often tingle, like they're humming with electricity. This increase in paresthesias reminds me of the feedback you get from a microphone when you speak into it too loudly. I've decided to interpret these feelings in the most positive light. I envision the cells that surround my nerves with myelin laboring like tiny construction workers, putting in overtime trying to repair the damage now that they have the raw materials.

I wonder about my difficulty finding words. I am increasingly aware of a second or two delay in my speech while I mentally search for the precise word that I want to use. I picture an electrical charge in my brain looking for the neuronal path that leads to the right word, but repeatedly sidetracked by the short circuits of demyelination. Is this merely fanciful? Am I imagining the word-finding problem altogether? Or am I actually experiencing the impaired concentration that can accompany the menopause?

"Medicine doesn't have much to offer you yet," my family doctor tells me. "Read what information is out there, eat right, exercise, avoid stress, maybe meditate."

I will. In fact, this semester I'm on medical leave to work on my healing and I'm looking for a less stressful job. To decrease my risk of cancer I'm eating more fruits and leafy green vegetables and continuing to monitor my salt and fat intake.

"Keep exercising," says my friend Lisa, who definitely does have MS. "You can always do more than you think you can."

I will. It's slow going, but I'm getting stronger and hope to be able to run a mile again before the year is out.

"Keep getting your B₁₂ shots," my cousin tells me, as she recovers from her surgery.

Oh, I will. In fact, I'm back to biweekly shots since my B₁₂ level went down to 507. I'm doing my best to avoid more short circuits. □

How African-American Women Look at Breast Cancer

Perceptions from Rural North Carolina

Anuja Kandanatt Antony, MSIII

Every year many women are diagnosed with breast cancer. About one in eight women will develop breast cancer in her lifetime. In North Carolina, breast cancer is the second leading cause of cancer deaths in women. The situation is even more disconcerting when looked at in terms of race. African-American women typically come to medical attention later and follow-up irregularly, giving them a much poorer prognosis than their white counterparts. African-American women have a 1.6 times higher risk of dying at 5 years, as well as a greater risk of recurrence, shorter overall survival, and shorter survival after relapse than white women.¹

One factor contributing to this dismal picture is the failure of African-American women to seek out ways to detect and prevent breast cancer, or to seek treatment in a timely manner. A study of women in two NC counties found that only half as many African-American women as white women reported ever having had a mammogram (27% vs 52%) or having had a mammogram in the preceding year (17% vs 36%).² Furthermore, African-American women present for care with cancer at a more advanced stage.³

Investigation as to why these women delay seeking treatment has revealed disturbing cultural, social and religious beliefs.⁴ For instance, Mathews et al⁵ interviewed 26 African-American women from rural NC who had been diagnosed with advanced breast cancer. The authors hoped that in-depth interviews would help them understand cultural adaptation to individual episodes of illness. Women described cancer as "gobbling up [their] insides" and made comments like, "I don't hold with the idea of poking around to look for lumps." They expressed religious conflicts and fear of treatment. I thought it reasonable to look for similar attitudes in Brunswick County, a geographically varied county with little public transportation, and many social, racial, economic, and age-related disparities.

In 1997, the Kate B. Reynolds Foundation allocated funds to the Health Department Board and Dr. Lee Langston of the Chicora Medical Center for a family-focused community and work-site wellness program in Brunswick County. The program's objectives were to motivate individuals to accept responsibility for their health, to increase vitality and length of life, and to decrease healthcare costs to families by preventing long-term illness. One target population was the membership of the predominantly African-American Big and Little Macedonian Churches.

Included in the program was a survey of issues surrounding breast cancer prevention and detection, and of breast cancer services available to African-American women in Brunswick County, specifically to members of the Big and Little Macedonian Churches. The study hoped to determine whether these women, like some other North Carolinians, harbored fears that might keep them from seeking treatment. We wanted to enhance breast cancer educational services in the community and to assess the prevalence of and receptiveness to methods of breast cancer prevention and detection.

Methods

Before implementing educational activities, we assessed services already available and the barriers to use of such services that might preclude their effectiveness. We obtained sociodemographic data concerning Brunswick County from the Brunswick County Health Department and local organizations, and we reviewed pertinent published literature.

We devised a survey questionnaire (see Appendix) to explore issues that might impede women from obtaining health advice about breast lumps in a timely, appropriate fashion. The questionnaire also assessed the extent of health information available to African-American women in this part of rural NC.

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Results

Little to no provision had been made for breast cancer services to African-American women in Brunswick County. A few pamphlets and some printed material about breast cancer statistics were available, but distribution and access were severely limited.

A total of 26 African-American women between the ages of 30 and 80 completed the questionnaire; 88% had had at least one mammogram, and 81% had had a mammogram within the past year. Three-quarters of the women surveyed said they had heard about mammography from the "doctor," with the remainder endorsing "other health practitioner," "friend," "family member," or the media. Eighty-five percent of women said they would "seek a doctor" if they found a lump in their breast, and 50% said they would "ask for mammography."

In terms of breast self-exam (BSE), 48% of women indicated a doctor had been their source of knowledge about this procedure; 33% indicated "booklets" or "BSE shower cards," and 19% indicated "Health Department." Of the 26 women surveyed, 96% said that they would seek treatment if a breast lump were discovered, and all of these women endorsed the entry "Yes, because the treatment would help." Only two of the surveyed women said that they would have a "religious conflict" or were afraid that a diagnosis of cancer would mean "God was angry with them"; only one woman indicated that she would not seek treatment.

Discussion

One unique aspect of Brunswick County is its widely distributed population. This has made development and maintenance of health-related organizations in the area difficult. Organizations and programs that have taken root in adjoining counties not much more than 30 minutes away have failed to be established or thrive in Brunswick County. This has been especially true of breast cancer detection and prevention and survivor-support groups. Not surprisingly, then, we found few or no breast cancer services for African-American women in the Brunswick County area. In sharp contrast, projects such as Save Our Sisters, a program in adjacent New Hanover County specifically targeted to the needs of African-American women with breast cancer, has been firmly established and its success well-documented.^{6,7,8}

Organizations like the Health Department or the American Heart Association, which want to provide cohesive, continuous contact with the indigent population, have been limited by the lack of public transportation and the geographically disperse population. Other complications arise from the economic, social, and age-related discrepancies among the residents, many of whom are elderly citizens who

have retired from the northern US to coastal North Carolina. Thus, developing or promoting programs to identify health problems or provide support has required extreme diligence and creativity on the part of interested parties.

Nevertheless, the community and the Health Department have an active interest in and desire for educational service. Existing programs such as the Kate B. Reynolds Wellness Program at the Health Department and monthly health talks given at the Big and Little Macedonian Churches provide an excellent vehicle for breast cancer education.

To test receptiveness of these rural women to information about self-care for breast cancer, we held lectures and open discussion on breast cancer incidence and prevalence, risk factors, methods of detection and prevention including breast self-examination and mammography at the Big and Little Macedonian community health meeting. The interactive forum provided insight into concerns and ideas women had about breast cancer and other health issues such as cholesterol and caffeine intake and hormonal or drug therapies that can affect breast tissue directly or indirectly. Feedback after the talk demonstrated women's interest in distinguishing fibrocystic tissue from neoplasms, a topic aided by breast models obtained specifically for this purpose. The women seemed inspired to voice their concerns and receptive to using breast cancer detection and prevention methods.

The women surveyed maintained close communication with a family physician and other health practitioners in the community. Most of the women surveyed (88%) had had a mammogram, 81% had one within the past year. This is sharply contrasted with prior findings of 27% and 17%, respectively, in two different North Carolina counties.² The fact that 76% of the women indicated that they had heard about mammography from their doctor stresses the influential role of the physician as information and service provider. The positive, trusting, and supportive role of the physician was further demonstrated when 85% of women said that they would seek a doctor if they found a lump in their breast, and 48% cited the doctor as the source of information about breast self-exam. Empowering women to partake in their own health assessment might be one of the most important roles of the physician, although health material accessible through health agencies like the Health Department may be helpful.

Since the women surveyed belonged to the Big and Little Macedonian Churches, we were concerned that religious sentiment might elicit religious convictions impeding treatment. However, nearly all (96%) of the women said that they would seek treatment, and all of these women acknowledged the efficacy of the treatment. (There may well be some bias in the sample of women surveyed since all were attending health talks and thus might be more inclined to an active interest in their own health and less prone to personal religious or cultural fears). Still, the ability of community talks, incorporating active roles for physicians and other health agencies, to evoke an overwhelmingly positive response



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implies a substantial role for education. It is important to empower women to take an active interest in their own health care and thus supplant many of the fears noted in the literature with a supportive, interactive health environment. This seems especially appropriate for communities with the geographical, economic, and social barriers like those encountered in Brunswick County. In fact, this kind of interaction is the basis of many successful programs such as Save Our Sisters which recruits "natural helpers" and transforms them into "lay health advisors" so that community members become directly involved in increasing mammography screening, complementing the more specialized role of health professionals.⁷

Conclusion

Educational services and support from health practitioners can motivate women—perhaps particularly those of African-American descent—who have been found elsewhere to be reluctant about or resistant to self-care initiatives. I found that these women can be motivated to begin self-sustaining breast cancer prevention and detection programs. These programs should improve rates of early cancer detection and can encourage women to seek treatment in a timely, appropriate fashion. The fears that delay women in seeking help can be allayed by knowledge about ways to treat breast cancer. Hopefully, women's decisions about their health care can then be based on an informed consideration of treatment options rather than false premises or uncontrolled fears. □

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Breast Cancer Detection and Prevention Survey

1. Please specify to which age group you belong: ☐ 0-15 ☐ 15-19 ☐ 20-25 ☐ 25-30 ☐ 31-40 ☐ 41-50
☐ 51-60 ☐ 61-70 ☐ above 71
2. To which ethnic group do you qualify yourself? ☐ Caucasian ☐ African-American ☐ Hispanic-Latino
☐ Asian/Pacific Islander ☐ Other
3. Do you visit a doctor regularly?
☐ Yes ☐ No
4. Have you ever heard of a mammogram? ☐ Yes ☐ No
 If so, how did you find out about it?
☐ Doctor ☐ Friend ☐ Health Practitioner
☐ Family Member ☐ Other (specify): _____
5. Have you ever had a mammogram? ☐ Yes ☐ No
 If so, when was your last one done?
☐ 1998 ☐ 1997 ☐ 1996 ☐ 1995 ☐ 1994 ☐ 1993
☐ 1992-1990 ☐ 1990-1985 ☐ Before 1985
6. Have you ever performed a breast self-exam? ☐ Yes ☐ No ☐ _____
 If so, how did you learn about it?
☐ Doctor ☐ Health Dept. ☐ Friend ☐ Booklet
☐ Shower Card ☐ Other _____
7. If you found out that you had a lump in your breast, what would be your next action?
☐ Talk to a friend ☐ Wait to see if anything happens
☐ Seek a doctor ☐ Not sure
☐ Ask for mammography ☐ Do nothing
8. If you were diagnosed with breast cancer, which one of the following would characterize your reaction:
You may mark more than one.
☐ Feel like there is something I can do about it
☐ Feel like there is something I can do about it but I have a religious conflict with the treatment
☐ Afraid because I had a relative who died from cancer
☐ Afraid of dying or the unknown
☐ Afraid because I don't think there is anything I can do about it
☐ Angry because I don't deserve this
☐ Feel like God or power above is angry with me or that I have done something wrong
9. If you were diagnosed with breast cancer, would you seek treatment?
☐ Yes ☐ No *If no, go to question 10. If yes, go to question 11.*
10. If you answered no, please mark any of the following which apply:
☐ No, because I am scared of the treatment
☐ No, because of cost concerns
☐ No, because I don't want to put my family through this
☐ No, because I am embarrassed
☐ No, because I don't think breast cancer is a big deal
☐ No, because I don't think treatment will have any effect
☐ No, because worrying will make it worse
☐ No, because this is God's will
☐ No, because seeking treatment will conflict with my religious beliefs
☐ No, because seeking treatment will conflict with my personal beliefs
☐ No, because I don't want to lose a breast or breasts
☐ No, other _____
11. If you answered yes, please mark any of the following which apply:
☐ Yes, because I think treatment will help
☐ Yes, because I am afraid of dying
☐ Yes, because I don't want to let my family down
☐ Yes, because I believe I will be cured
☐ Yes, because losing a breast is a small price to pay
☐ Yes, because I have heard about treatment options and I feel confident in the treatment
☐ Yes, because my doctor advises the treatment
☐ Yes, other (specify): _____
12. Do you feel that you are receptive to breast cancer education?
☐ Yes ☐ No

A Tale of Two Angels

O'Neill F. D'Cruz, MD

A desk-load of paper work greeted me upon my return from vacation. Teaching, research, clinical and administrative tasks were vying "for preferred and expedited handling."

Waiting for the computer to boot up, I dug into a pile of correspondence. The computer screen ("You have 127 messages.") could not compete for my attention with a holiday card enclosing a snapshot of a joyful, cherubic infant. The handwriting was a vaguely familiar scribble; the signature left no doubt. It took me back to a time not too long ago when I answered a phone call from the writer:

"My daughter had an hour-long seizure earlier today. She's sleeping quietly now."

Gwen was the dedicated, reliable mother of a three-year old daughter with cerebral dysgenesis. Although the child had frequent seizures, this one sounded a bit worrisome.

"Could you get her meds in today?" I asked. The child received medications and fluids through a tube into her stomach. We had recently discussed the possible need to replace the tube, because of mechanical problems and bleeding at the entry of the tube through the skin.

"Oh yes. I was just calling to find out what I should do if she has another seizure." Gwen's life was a juggling act of child care, transportation, and domestic duties. The two-hour drive to the hospital would take a good deal of advance planning. Still, this sounded serious enough to ask her to come in. I gave her instructions, and called the ER in anticipation of her arrival.

By the next morning, Gwen had not shown up at the ER. I figured her child had had a quiet evening, but, as it turned out, it was only the quiet before the storm about to break. Soon, the ER staff called to tell me that Gwen had been in touch and an ambulance was on the way to the hospital with her and her daughter. I reviewed my ideas about treatment and waited for another phone call. The call never came. The ambulance arrived, but the child was moribund. Despite the efforts of the ER and pediatric intensive care unit (PICU)

staffs, the daughter died. Gwen returned home alone.

"I should have brought her in when I talked with you, instead of waiting like I did," Gwen said when I called her. "But she seemed fine that evening. I even stayed up late to check on her, but when I woke in the morning, I found her in a seizure. I came as fast as we could."

Gwen had been through three difficult and demanding years, including many nights by her daughter's side. When her daughter was diagnosed with cerebral dysgenesis, Gwen had tried her best to educate herself about this complex medical problem. She joined a support group, and talked to other parents facing similar situations. When the support group planned a national meeting, she looked forward eagerly to attending so she could share ideas and experiences. Gwen and her husband had little money, and so the local newspaper ran a special story to raise funds for the trip.

Her unspoken concerns were ever-present, but rarely raised at doctor's visits. Gwen, who had waited many years after marriage to start her family, had another daughter who was struggling for parental attention. Her husband had to make difficult choices required of a sole breadwinner and a supportive father. Gwen believed that the real reason for her late start at motherhood was so that she would be prepared for a challenge she could not have met at an earlier age. "God picked us out," she said with a mother's love, "to take care of his little angel." I reassured her that no mother could have done more, but she told me she was scared: she was half-way through a third (and unplanned) pregnancy. So far things had gone well, but the latest emotional crisis had left her reserves nearly exhausted.

"She's in heaven now. I know she's not suffering any more, but I still miss her." She talked and I listened for several minutes. It is never easy to come to terms with loss. Finally, she asked, "Is it OK if I call you...." She stopped, but I knew what was on her mind.

"Please do. And send me a picture when the baby arrives." Gwen had to prepare for motherhood once again. Without saying it, both she and I were hoping she would not need my professional opinion as a pediatric neurologist. I never even thought that I would need her strength and

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experience to handle a situation that was to unfold several weeks later.

The consultation call came in the middle of a busy morning. "I've got Junior here in the PICU, and he's not going to make it. His mother asked me to get in touch with you. Do you remember him?" I did, and decided to sit down. This one was going to take a while.

Junior was a four-year-old with cerebral dysgenesis. His severe neurological problems had previously led to dire predictions of impending death. His resilience was matched only by his mother's perseverance. She was not about to let anyone, including herself, decide that Junior was "living on borrowed time" (as a doctor had once put it). But this time she had found him pulseless and apparently lifeless. After several vigorous and aggressive resuscitations, Junior made it to the PICU. Then multiple organs failed, and this time machines and drips and drugs could not forestall the inevitable outcome. The intensivist called me only to discuss end-of-life issues. A couple of days later, Junior succumbed to severe hypoxic-ischemic injury. I called his mother at home.

"I should have let him go, Dr. D'Cruz," she began, "but I just could not bring myself to do it. He was my only child." She retold the events of that fateful morning: I told her that she had done right to follow the parental instinct to fight for Junior's survival. "If you had given up on him, you would always wonder, and now you know that you didn't."

"How's his Dad doing?" I said, trying to gauge her support structure.

"Well, you know him. He won't talk, but he's hurting, too." She had a companion in her grief, but no one to listen to her with empathy.

"Does Gwen know?"

Gwen and Junior's mother had met in a patient lounge during one of their numerous visits to see me. When they discovered that their children shared the same rare kind of brain malformation, they bonded instantly and had been there for each other ever since. Junior's mother was a private person. She did not readily seek social support, so I was glad to hear that she was talking things over with Gwen.

The two mothers shared their grief, and they came to terms with life in their own ways. Gwen completed a pregnancy that was "medically unremarkable," but surrounded by considerable anxiety. Junior's mother offered her support to other families; she even traveled half-way across the country to be with them in their hour of need. The steady influence of Gwen's daughter and Junior went beyond time. They brought together many people and planted seeds of a friendship that held steadfast.

I looked down at the photograph of Gwen's healthy new infant daughter smiling at me. A ringing sound signaled that two of God's angels had earned their wings. Or was it just the phone again, summoning me to the service of life? □



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Running the Numbers

A Periodic Feature to Inform North Carolina Physicians and Their Patients
About Current Topics in Health Statistics

Paul A. Buescher, PhD, Editor

Completing Death Certificates

The information supplied by physicians in the medical portion of the death certificates is critical to understanding the health problems facing North Carolinians. The cause-of-death section of the death certificate consists of two parts: **Part I** reports a chain of events leading directly to death, proceeding from *immediate cause* (final disease, injury, or complication directly causing death) to *underlying cause* (disease or injury initiating the chain of events leading directly to death). Health statistics are most often tabulated by the underlying cause of death. **Part II** reports all other significant diseases or conditions that contributed to death but did not result in the underlying cause of death as given in Part I. If, in the physician's best medical opinion, the use of alcohol, tobacco, or other substances by the decedent, or a recent pregnancy or injury caused or contributed to death, then this condition should be reported. The sample death certificate below is properly completed.

| | | |
|---|---|--|
| Part I Enter the diseases, injuries, or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. If appropriate, enter tobacco, alcohol, or drug use. List only one cause on each line. (PRINT or TYPE) | | Approximate Interval Between Onset and Death |
| IMMEDIATE CAUSE → (Final disease or condition resulting in death) Sequentially list conditions if any, leading to immediate cause. Enter UNDERLYING CAUSE (Disease or injury that initiated events resulting in death) LAST | a. Rupture of myocardium DUE TO (OR AS A CONSEQUENCE OF): | Mins. |
| | b. Acute myocardial infarction DUE TO (OR AS A CONSEQUENCE OF): | 6 days |
| | c. Chronic ischemic heart disease DUE TO (OR AS A CONSEQUENCE OF): | 5 years |
| | d. | |
| 20a. Part II. Other significant conditions contributing to death but not resulting in the underlying cause given in Part I, such as tobacco, alcohol, or drug use; diabetes, etc. 20b. Diabetes, Chronic obstructive pulmonary disease, smoking | | |
| AUTOPSY? (Yes or No) If yes, were findings considered in determining cause of death? Was case referred to Medical Examiner? (Yes or No) | | TIME OF DEATH |
| 21a. Yes | 21b. Yes | 21c. No |
| | | 22. 2:30 p. m. |

Line (a) of Part I should always have an immediate cause of death entry. Generally, the mode of dying (for example, cardiac arrest and respiratory arrest) should not be used; if the physician finds it most appropriate for line (a), however, then he or she should always list its cause(s) on the line(s) below it (e.g., cardiac arrest due to arrhythmia due to ischemic cardiac disease). For each cause indicate the best estimate of the interval between presumed onset and date of death, using "approximately" or "unknown" as needed.

The death certificate should be completed and signed within three days after death occurs. When ascertainment of the cause(s) of death is delayed because of a pending autopsy or laboratory test, a death certificate stating this should be signed and forwarded to the local health department. The lab or autopsy information should be entered on a supplemental cause-of-death report and sent directly to the health department as soon as available, so that more accurate information can be added to the death certificate. A supplemental cause-of-death report may also be used any time the attending physician wishes to add to or change this information. Deaths due to accident, suicide, or homicide, or deaths that are suspicious or medically unattended, must be referred to the Medical Examiner.

For more detailed written guidance on completing death certificates or for questions, contact the Vital Records Branch of the State Center for Health Statistics at (919) 715-8962.

From the State Center for Health Statistics
www.schs.state.nc.us/SCHS
North Carolina Department of Health and Human Services

Gatling and Guillotin

Two Physicians Far Afield

Robert Edgar Mitchell, Jr, MD

I will prescribe regimen for the good of my patients according to my ability and my judgement and never do harm to anyone. To please no one will I prescribe a deadly drug, nor give advice which may cause his death.

— *The Oath of Hippocrates*

In the course of their professional lives, Richard Jordan Gatling and Joseph Ignace Guillotin, both physicians, strayed far from their chosen paths. As a result, their names are forever associated with weapons of death and destruction. A brief review of their lives and the uniquely diabolical machines named for them may provide a time for atonement.

Plowshares into Swords

Gatling was born September 12, 1818, in Hertford County, North Carolina. He died on February 26, 1903, in New York City and is buried in Crown Hill Cemetery in Indianapolis, Indiana. As a youngster on the family farm he became interested in how to improve agricultural machinery. In 1841, he designed a screw propeller for ships, but was unable to get it patented.¹⁻³ Ericksson had already patented a similar device, which proved helpful to maritime shipping and navigation. In 1844, Gatling invented and successfully patented a rice and wheat planter. Wheat farming was especially important in the West, and this machine provided a tidy income for Gatling.¹⁻³

In the winter of 1845, Gatling contracted smallpox while ice-bound on a steamer in the Ohio River. The illness was nearly fatal; after three months of isolation in Pittsburgh, he finally recovered, but forever bore the stigmata of pox scars.^{1,3}

Dr. Mitchell, a gastroenterologist, is Clinical Professor of Medicine at the Medical College of Virginia in Richmond. He can be reached at 7605 Forest Avenue, #211, Richmond, Virginia 23229.

In 1847, Gatling matriculated at Indiana Medical College at LaPorte, then transferred to Ohio Medical College in Cincinnati from which he graduated in 1849.^{3,4} His medical education was rudimentary at best, but more or less typical of the times. It is doubtful that it included a course in ethics, but it did provide him with the title "Doctor" even though the practical or moral aspects of medicine do not seem to have been part of Gatling's personal experience.

Gatling made an early attempt at marriage, but it ended in annulment. In 1854, at age 36, he married 16-year-old Jemima Sanders, daughter of a physician and aunt of Major General Lewis "Lew" Wallace, USA, of Civil War fame and author of *Ben Hur*. He renewed his interest in machinery, developing a hemp fiber separator, a motorized plow, and a flying machine, but his signature invention came in 1861, when the idea for the machine gun arose.^{1,3,4} Put into manufacture by Colt, the gun could fire more than 200 shots a minute. It was always intended as an instrument of death, although Gatling fervently (if erroneously) claimed his invention would reduce the horrors of war and the need for large armies. During the Civil War, because of his Southern origins, Gatling was accused of belonging to various anti-American groups including the Copperheads. Cleared of these charges, for the next 30 years he worked at improving and selling his patented machine gun and others he was developing.

In 1864, Gatling got models of his gun into the hands of Union General Benjamin Butler in the battles of the Bermuda Hundred near Petersburg, Virginia, where they caused many Confederate deaths. During the remainder of the Civil War, the Gatling gun saw only very limited use. Nevertheless, it was the prototype of the rapid-fire guns that changed the course of military history. In World War I, machine guns proved especially devastating; the British lost 20,000 soldiers in one day at the Battle of the Somme, and machine guns have been among the chief culprits in other equally deadly battles.^{1-3,5,6} In 1911, the original Gatling gun was declared obsolete, but its offspring became part of the arsenals of



By permission of *Indiana Medicine* 1988;81(12):1006.

Richard Jordan Gatling

1847-49 Indiana Medical College, LaPorte, IN
 MD, Ohio Medical College, Cincinnati, OH
 1850 Diploma, Ohio State Board of Agriculture
 1861 Rapid firing machine gun patented
 1891 President, American Association of Inventors and Manufacturers
 1943 USS Gatling (destroyer) launched
 1944 SS Gatling (liberty ship) launched



By permission of *JAMA* 1972;220(1):85.

Joseph Ignace Guillotin

1770 Doctorate in Medicine, University of Paris
 1790 Committee of Health (for reforms in the medical curriculum)
 Professor, Faculty of Medicine, University of Paris
 Docteur Regent
 President, Vaccines Committee
 President, Medical Circle

several European nations and played major roles in death and destruction in the Spanish American War, the two World Wars, and the Korean and Viet Nam Wars.^{1,3-5} Gatling's gun, which was supposed to make war obsolete, only made it more lethal.

Although he never set up a formal medical practice, Gatling always referred to himself as "Doctor Gatling." The son of a talented planter and inventor, Gatling was a gifted inventor in his own right. The agricultural implements he invented brought in considerable income (although he is said to have died penniless).^{1,3,4} He was described as an intellectual, amiable gentleman, fond of books, his workshop, and his friends. Most paradoxical is how this man, trained as a physician and healer, could so contravene the doctor's mission by building and continuing to refine death-dealing machines. Physicians ought to be healers and advocates for health, not intentional killers.^{5,7} But the Hippocratic Oath lay in tatters about this physician who chose to make guns instead of healing the sick.

Off with Their Heads

Joseph Ignace Guillotin was the second son and one of twelve children of a wealthy and honorable bourgeois lawyer, born at Saintes, France, on May 28, 1738. Guillotin is reputed to have been born prematurely when his mother's labor was induced by the screams of a criminal being broken on the wheel. The story may be apocryphal, but it is prophetic.⁹⁻¹⁰ Ignace trained at the Jesuit College in Saintes with plans to enter the priesthood in Bordeaux. In 1763, however, he abandoned his study of the priesthood for personal reasons and took up the study of medicine, in order to minister to the body as well as the soul. After obtaining his doctorate in medicine at the University of Paris on August 27, 1770,^{8,11} he progressed rapidly and soon became *docteur gouverneur* on the Paris faculty.^{8,10,11} Guillotin, along with Dr. Jean-Paul Marat, became the most sought after physician in Paris, his advice sought by all classes. At the age of 50 Guillotin married Marie-Louise Sangran, who was in her thirties.

On September 17, 1790, Guillotin founded a Committee of Health, composed chiefly of physicians, to reform and upgrade the medical school teaching of pharmacy, surgery, midwifery, and medicine. In 1791, the Bill of Medical Reform established secondary schools of medicine, including military medical schools, and a revised curriculum for the colleges of medicine at Paris, Montpellier, and Strasbourg.^{8,10,12} Active as these reforms were, they came seven years after Pierre Joseph De Sault had actually begun the practice of bedside teaching at the hospitals of Charité and Hôtel-Dieu.

Felix Vicq d'Azyr, celebrated anatomist, had founded the Royal Society of Medicine in 1778. In 1793, in the aftermath of the Revolution, the societies and academies and eventually the faculties of medicine were abolished. Charlatans were free to ply their dubious practices on a defenseless public unchecked until 1803. At that time it was decreed that, as proposed initially by De Sault and Guillotin, practitioners of medicine and surgery must be qualified from schools of health. French medicine slowly made its comeback from near disaster.^{9,11,12}

As events leading to the French Revolution unfolded, the Terror reached a crescendo of wholesale executions. The Bastille fell. Guillotin, speaking as a deputy before the Assembly, urged Louis XVI to accept a declaration on the rights of man similar to those already in place in the United States and England. All hoped for an era of peace, but things only got worse. In 1789, Guillotin spoke again to the National Assembly on the horrors of torture. With an eye toward lessening the abuses of slow and painful dying, he first discussed a machine for beheading.^{10,11,13} This device would ensure quick and painless executions: "The mechanism falls like thunder, the head flies, blood spurts, and the man is no more." Guillotin himself never drew up actual plans for such a decapitating machine, but his speeches and writings certainly favored a model based on earlier machines used by the Germans, Scots, Italians and English.^{9,10,11,13}

The National Assembly and the king were at loggerheads in regard to freedom. Ideas brought forward by Guillotin and his friends (Benjamin Franklin, Dupont de Nemours, Jean-Sylvian Bailey [the astronomer], Antoine Lavoisier [the chemist], and Lafayette) pushed for equality in death regardless of the condemned person's status. Guillotin felt that no one should be hanged, decapitated by sword, or broken on the wheel. Dr. Antoine Louis, surgeon and secretary of the Academy of Surgeons, agreed with Guillotin. He proposed a device with a perpendicular blade.^{10,12,13,14} The actual machine was designed and put together by Tobias Schmidt, a German piano maker, and used an oblique blade. King Louis XVI actually helped design the very blade to which he would succumb nine months later at what is now the Place de la Concorde in Paris. Guillotin was present when the machine was first tried on sheep and later human corpses, but he was not present when the first criminal was beheaded on April 25, 1792, nor at any other executions by decapitation.

He said he did not want his name associated with "the machine." Too bad for him! The machine became known by his name (the added "e" is because, in French, the noun is feminine), and history has now made it a symbol of bloody uprising and criminal executions.^{9,13,14}

Guillotin himself, charged with being an elitist, was hauled before the Assembly, but fortunately the charge was eventually disproved and he was let off, escaping the executioner's hand.^{11,13,14} It was anthrax which eventually killed him, at 77 years of age. He was buried in Pere-Lachaise Cemetery in Paris. During his long life, he had championed the use of vaccination all over France, had been a professor on the Faculty of Medicine of the University of Paris, a member of the National Assembly, president of The Vaccine Committee, and president of his medical circle. In addition to his many accomplishments as *docteur regent* and his notable medical and political careers, he was also a social reformer.¹⁰ Today, ironically, Guillotin is remembered only as the namesake of an efficient, offensive, decapitating machine—symbol of the Terror and of a time when absolute power corrupted absolutely.¹³

Discussion

We have here thumbnail sketches of two highly intelligent physicians of diverse bent, both of whom ventured far from the paths of medicine. One invented improved agricultural machinery but his name is etched in history because he developed a death-dealing machine gun; the other immersed himself first in medicine and later politics and social reform, but his name is linked with a beheading machine. In terms of name-recognition, both were successful, certainly, but at what cost? This brief look at Gatling and Guillotin makes us thankful that the Hippocratic oath has miraculously survived and remains the code of professional behavior for all physicians.

Other doctors have strayed into the fields of mayhem and destruction. These include Ernesto "Che" Guevara, Argentine physician and dealer in revolution, intrigue, death and destruction; Josef Mengele, German doctor of WWII concentration camp notoriety; and Jean-Paul Marat, physician at the royal court of Vincennes and later participant in the Terror whose labyrinthine career started nobly and ended in ignominy.

Thirteen medical doctors are currently suing the California Department of Corrections because they claim that physician participation in executions is unethical and unprofessional. They want it prohibited by law. Ethicists like Linda Emanuel, MD, agree, but, interestingly, the California Medical Board does not consider participation in execution as unprofessional conduct. France abolished capital punishment by any method in 1981, as have most other civilized nations. In the United States, we tolerate it by whatever

method the several states prefer, and we often mandate official participation by physicians. *Quo vadis medicina?* □

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Carolina Physician's Bookshelf

E. C. Halperin, MD, Book Review Editor

New Books, Briefly Noted

Trying to Give Ease: Tommie Bass and the Story of Herbal Medicine

by John K. Crelin and Jane Philpott. Durham, NC: Duke University Press, 1990. \$16.95.

A Reference Guide to Medicinal Plants: Herbal Medicine Past and Present

by John K. Crelin and Jane Philpott. Durham, NC: Duke University Press, 1990.

Dr. John Crelin is a former Professor of Medical History at Duke Medical School. He currently is John Quince Professor of the History of Medicine at Memorial University of Newfoundland. His collaborator, the late Jane Philpott, was an Emeritus Professor in the Department of Botany in the School of Forestry and Environmental Studies at Duke.

The Duke University Press recently sent us two paperbacks by Crelin and Philpott; both focus on Tommie Bass, an Appalachian herbalist, and his herbal remedies for an assortment of diseases. *Trying to Give Ease* focuses on recorded interviews with Bass and his "patients" as well as the context in which his herbal medicine is used. The 500-page *Reference Guide* lists various herbal and natural remedies alphabetically, accompanied by Mr. Bass's comments, the scientific name of the plant, and referenced entries on the medicinal uses of the plant—a contribution to the discipline which is properly called pharmacognosy.

Healthy Markets? The New Competition in Medical Care.

Edited by Mark Peterson. Durham, NC: Duke University Press, 1998. Paperback \$22.95; cloth, \$64.95.

Mark Peterson, a Professor of Policy Studies at UCLA, has edited this compendium of essays and commentary on the competitive market for health care. The contributors include

political scientists, public policy professors, psychiatrists, and economists. The book may prove to be of interest to academicians in public policy but is unlikely to hold the attention of a practicing clinician.

Medical Warrior: Fighting Corporate Socialized Medicine

by M.A. Faria Jr. Macon, GA: Hacienda Publishing, 1997, \$23.95.

Sutton's Law: A Novel

by J.M. Orient and L.J. Wright. Macon, GA: Hacienda Publishing, 1997, \$21.95.

Hacienda Publishing has sent us two new offerings. *Medical Warrior* is a collection of essays by Dr. Faria, former editor of the *Journal of the Medical Association of Georgia*. Consistent with his past writings, Dr. Faria attacks managed care as an assault on individual freedom and the capitalist system. *Sutton's Law* is a mystery in which the heroine, a female internist, does battle against an evil managed care corporation that will stop at nothing, including murder, to get its way.

I think we understand where Hacienda Publishing is coming from: a medical publishing house specializing in a particular conservative medicopolitical point of view. I'm sure they have this market niche sewed up.

The editor invites readers to submit for review books of potential interest to the *Journal's* audience, including works on any aspect of medicine or by North Carolina physicians. Submissions should be sent to Edward C. Halperin, MD, Box 3085 DUMC, Durham, NC 27710.

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A Rural Lexicon

compiled by Steven E. Landau, MD

You have to know the culture of the system as well as the science of the system in order for things to work at all.

— Eugene A. Stead, Jr., MD

Things that are insanity in New York City are culture in North Carolina.

—John Homan, MD

| Word or Phrase | Meaning | Example |
|------------------------------------|---------------------------|---|
| a day and a night | 24 hours | I don't smoke much—not more'n a pack in a day and a night. |
| a week to die sudden | real slow | I'm so slow it'll take me a week to die sudden. |
| Arthur | arthritis | Old Arthur's got me bad, Doc! Got somp'n for it? |
| bad for | famous for | He's bad for burping in public. |
| clumb | climbed | He clumb up that pole jes' as neat as a cat. |
| cures all, kills none | good doctor | He's a good doctor—cures all, kills none. |
| dead pig in the sunshine | in bliss | I'm just as happy as a dead pig in the sunshine. |
| down to the short rows | nearly done | Reckon we're down to the short rows—only 20 charts left. |
| duck-legged | bow-legged | Her mama was kindly duck-legged. |
| ever who | whoever | Ever who talked to me was real mean. |
| fireballs of the Eucharist | fibroids of the uterus | I had my fireballs of the Eucharist took out. |
| get shed of | get rid of | I need to get shed of that man. He's a pure drunk. |
| good to go | ready and waiting | Your car's good to go for that Missouri trip, Doc. |
| head knocker-over | strong force | Him dying was a real head knocker-over. |
| I ain't lying. | I'm lying. | I ain't lying, he's bigger'n a house. |
| ill as a red-tailed wast [wasp] | exceedingly irritable | She's ill as a red-tailed wast since her divorce. |
| in high cotton | doing well | We were in high cotton after we got that van. |
| in moveable health | doing okay | I was in moveable health till this here stroke jumped on me. |
| jittery as a paint shaker | nervous | That medicine made me jittery as a paint shaker. |
| kidneys acted | urinated | My kidneys hain't acted in two days. |
| knocked me a-whining | struck me hard | When I complained, Pa knocked me a-whining. |
| long on drywall and short on studs | not well put together | That cashier is long on drywall and short on studs. |
| mash | press | Mash on the gas pedal, honey, we're outa here! |
| nervous as a chicken | nervous and agitated | She was nervous as a chicken, but that Xanax holp her. |
| pin stroke | transient ischemic attack | Pa'd been having these pin strokes, but now it's the big one. |
| prayed to die | felt real bad | I prayed to die but I lived instead. |
| pyurt | well, energetic | I feel right pyurt today. |
| smooth as Ex-Lax | real easy-like | The trip to Montana went smooth as Ex-Lax. |
| swimmy-headed | dizzy | After taking that-'ere medicine, I got right swimmy-headed. |
| tore all to pieces | in disarray | It tore me all to pieces when my uncle died. |
| toucheous | painful to the touch | Ow! That spot there's a mighty toucheous. |
| travelling fart | lot of GI gas pains | She had her a travelling fart, but that Mylanta holp her go. |

Dr. Landau practices family medicine in Kenly, NC, where his patients have introduced him to rich and imaginative variations on English usage. The above are selected examples from his collection of colorful sayings. Readers with their own memorable examples are invited to submit them to the *Journal*.

TO A CHILD USED TO
SEEING THINGS ON A
19" TV SCREEN IT CAN BE
QUITE AN EXPERIENCE.



Polar Bears at the North Carolina Zoo, Asheboro

ANNOUNCEMENT

The 1999-2000 Irwin A. Brody Award for an Essay on The History of Medicine

In order to stimulate interest in the history of medicine, the Irwin A. Brody Fund for the History of Neurosciences and the Medical History Society of Duke University Medical Center are sponsoring a competition for the best paper on a topic in medical history by a North Carolina medical student, fellow, or house officer.

The winner will receive \$500 and a certificate and will be invited to make a presentation at a meeting of the Medical History Society. The winning paper will also be considered for publication in the *North Carolina Medical Journal*.

Eligibility: Authors must be medical students, interns, residents, or fellows enrolled and in good standing during 1999-2000 at Wake Forest, UNC-Chapel Hill, Duke, or East Carolina medical schools, or other North Carolina medical institutions. Papers must be unpublished, but may be under consideration for publication when submitted.

Format: Essays must be original scholarship on a topic in the history of medicine or allied sciences, not to exceed 5000 words (exclusive of references, tables, and figures). The author's name should not appear on the paper. Send four copies of the manuscript, including tables and figures, with a separate sheet giving the author's name, address, current medical school status, and telephone number and the essay title.

Judging: Judges from the departments of history or medicine in at least two of the participating institutions will evaluate the submissions on the basis of originality, contribution to the history of medicine, quality of research, and quality of writing.

Deadline: All materials should be submitted by February 1, 2000, to

Dr. Albert Heyman
Brody Award for Medical History
Box 3203 DUMC
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For further information, contact
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CME Calendar

September 23-26

New Hanover - Pender County Medical Society 1999 Coastal Medical Retreat and 16th Aesculapian Sports Classic

Place: Bald Head Island

Credit: 8 hours Category 1, AMA

Fee: \$250

Info: Beth Mixon, 910/343-0161 [registration]; Judy Evans, 800/432-RENT [lodging]

September 24-26

UNC Vascular Center Venous Symposium

Place: Kingston Plantation Embassy Suites, Myrtle Beach, SC

Credit: 11.5 hours Category 1, AMA

Fee: Physicians \$195; other health care profs. \$165

Info: tel: 919/962-2118

email: jane_radford@med.unc.edu

September 25-28

12th Annual North American Agromedicine Consortium

Place: North Raleigh Hilton, Raleigh

Credit: Up to 16.5 hours, Category 1, AMA

Fees: See website: www.rheswakeahc.org

Info: Jacqueline Carter, Wake AHEC 3024 New Bern Ave., Suite G03, Raleigh 27610-1255; 919/350-8547, fax 919/350-7963; email: jgcarter@wakemed.org

October 1-2

Cardiovascular Disease: State of the Art 1999

Place: Boar's Head Inn, Charlottesville, VA

Credit: Up to 10 hours, Category 1, AMA

Fees: \$150

Info: Sponsored by UVA Office of CME, tel. 804/924-5310

October 7-9

Integrative Medicine: 4th Annual Integrating Mind, Body, and Spirit in Medical Practice

Place: Sheraton Imperial Hotel, Research Triangle Park

Credit: Up to 18 hours, Category 1, AMA

Fees: Physician \$500; nonphysician \$400

Info: Duke CME 919/684-6485

Internet: www2.mc.duke.edu/depts/medicine/intmed

October 29

19th Annual Oscar Miller Day Symposium on Cartilage Repair

Place: Charlotte Convention, 501 S. College St., Charlotte

Credit: To be confirmed

Fees: Physicians \$50; nonphysicians \$20

Info: Cary Sizemore 704/552-6565

November 5

5th Annual George T. Wolff MD Primary Care Symposium

Place: Moses Cone Hospital, Greensboro

Credit: Up to 6 hours, Category 1, AMA; 6 prescribed hours AAFP

Fees: \$50

Info: Greensboro AHEC: 336/832-7795; fax 336/832-2851

November 20-21

26th Alexander Spock Symposium

Place: Searle Center, Duke University Medical Center

Fees: \$150 physicians; \$90 allied health professionals; no charge for either in training

Info: Joseph Marc Majure, MD, Box 2994 DUMC, Durham 27710; 919/684-2289, fax 919/684-2292

March 29-April 2, 2000

International Conference on Physician Health

CALL FOR PAPERS Deadline October 31

Place: Seabrook Island, South Carolina

Info: Papers, poster presentations, and workshops on all aspects of physician health. Cosponsored by AMA and the Canadian Medical Association. For abstract forms, registration and fee information: Elaine Tejcek, AMA Physician Health Program, 515 N. State St., Chicago IL 60610; 312/464-5066;

email: elaine_tejcek@ama-assn.org.

Turning Point

Collaborating for a New Century in Public Health

Videoconference for citizens and medical professionals to share concerns and information on health issues in North Carolina. Sponsored by NC Dept. of Health and Human Services

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For information: 919/966-4032; www.sph.unc.edu/oce

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Peggy Payne is a novelist, political reporter, and travel writer. She has published in periodicals ranging from Medical World News to Cosmopolitan, including Ms. Magazine, The New York Times, Science Digest, and The Washington Post. Her fiction has been cited in Best American Short Stories, and her advertising writing has won a Gold Addie.

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For information and registration: 919/684-6259

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Instructions for Authors

The *North Carolina Medical Journal* is a medium for communication with and by members of the medical community of this state. The *Journal* publishes six times a year: in January, March, May, July, September, and November.

The *Journal* will consider for publication articles relating to and illuminating medical science, practice, and history; editorials and opinion pieces; letters; personal accounts; poetry and whimsical musings; and photographs and drawings. Papers that relate to the present, past, or future practice of the health professions in North Carolina are especially pertinent, but manuscripts reflecting other perspectives or topics are welcomed. Prospective authors should feel free to discuss potential articles with the editors.

Manuscript Preparation

Prepare papers according to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (N Engl J Med 1991;324:424-8) with the following exceptions: 1) no abstract is needed; 2) no running title is needed; and 3) report measurements in metric units; use of the International System of Units (SI) is optional.

Submit a cover letter and a 3 1/2-inch computer disk that contains the text written in MS DOS- or Macintosh-compatible format. *Also enclose three hard copies of the text for review purposes.* Double space text with one-inch margins. *Please do not "format" the text* (e.g. no variations in type size, no bold face, no italics, no embedded endnotes).

Submit photographic illustrations, in duplicate, as high-quality color 35mm slides or 5-by-7 or 8-by-10-inch glossy prints, or as black-and-white glossy prints (5-by-7 or 8-by-10-inch). Label all illustrations with author's name, number them sequentially according to their position in the text, and indicate the orientation of the images, if necessary. *Do not write directly on the backs of prints.* This can damage them. If figures require printing in four-color process, we may ask the author to pay printing fees or a portion thereof.

Submit tables, charts, and graphs as hard copy *and* include copies on disk, in their original format *and translated as TIFF, PICT, or EPS documents.* Type all figure legends separately. Type and double-space all tables, one to a single sheet of paper. Tables must have titles and consecutive Arabic numbers.

Keep references to a minimum (preferably no more than

15), retaining those that document important points. The "Uniform Requirements" cited above contain reference format. We customarily list the first three authors for "et al"-type references. Authors are responsible for the accuracy and pertinence of all citations.

Avoid abbreviations entirely if possible; keep them to a minimum if not. When used, completely define abbreviations at the first point of usage in the text.

Manuscript Review and Editing

A medically qualified editor reads all manuscripts and, in most instances, sends them out for further review by one or more other members of the North Carolina Medical Society. *Authors' cover letters must include a line that states that their submitted manuscripts are not under consideration for publication elsewhere. It is not the Journal's policy to reprint previously published articles.* Decisions to publish or not are made by the editors, advised by the peer reviewers.

We encourage a relatively informal writing style since we believe this improves communication. Imagine yourself talking with your unseen audience—as long as this doesn't lead you to scientific or linguistic inaccuracy. Be brief, clear, simple, and precise.

We edit accepted manuscripts for clarity, style, and conciseness. Except for letters, authors receive a copy of the edited manuscript for their review and approval before publication. Manuscripts not accepted will not be returned.

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Aphorisms of the Month

Daniel Sexton, MD, Section Editor

"Random Quotes from the Literati and Glitterati"

Everything great in the world comes from neurotics. They alone have founded our religions and composed our masterpieces.

—*Marcel Proust*

I would like to remind those responsible for the treatment of tuberculosis that Keats wrote his best poems while dying of this disease. In my opinion he would never have done so under the influence of modern chemotherapy.

—*Arthur Walker*

After two days in the hospital, I took a turn for the nurse.

—*W. C. Fields*

When a lot of remedies are suggested for a disease, that means it can't be cured.

—*Anton Chekhov*

Senescence begins
And middle age ends
The day your descendants
Outnumber your friends.

—*Ogden Nash*

When a genius appears in the world you may know him by this sign: all the dunces are in a confederacy against him.

—*Jonathan Swift*

You can take all the sincerity in Hollywood, place it in the navel of a fruit fly, and still have room enough for three caraway seeds and a producer's heart.

—*Fred Allen*

Martyrdom is the only way in which a man can become famous without ability.

—*George Bernard Shaw*

Section editor is Dr. Dan Sexton, Box 3605, DUMC, Durham, NC 27710. e-mail: sexto002@mc.duke.edu

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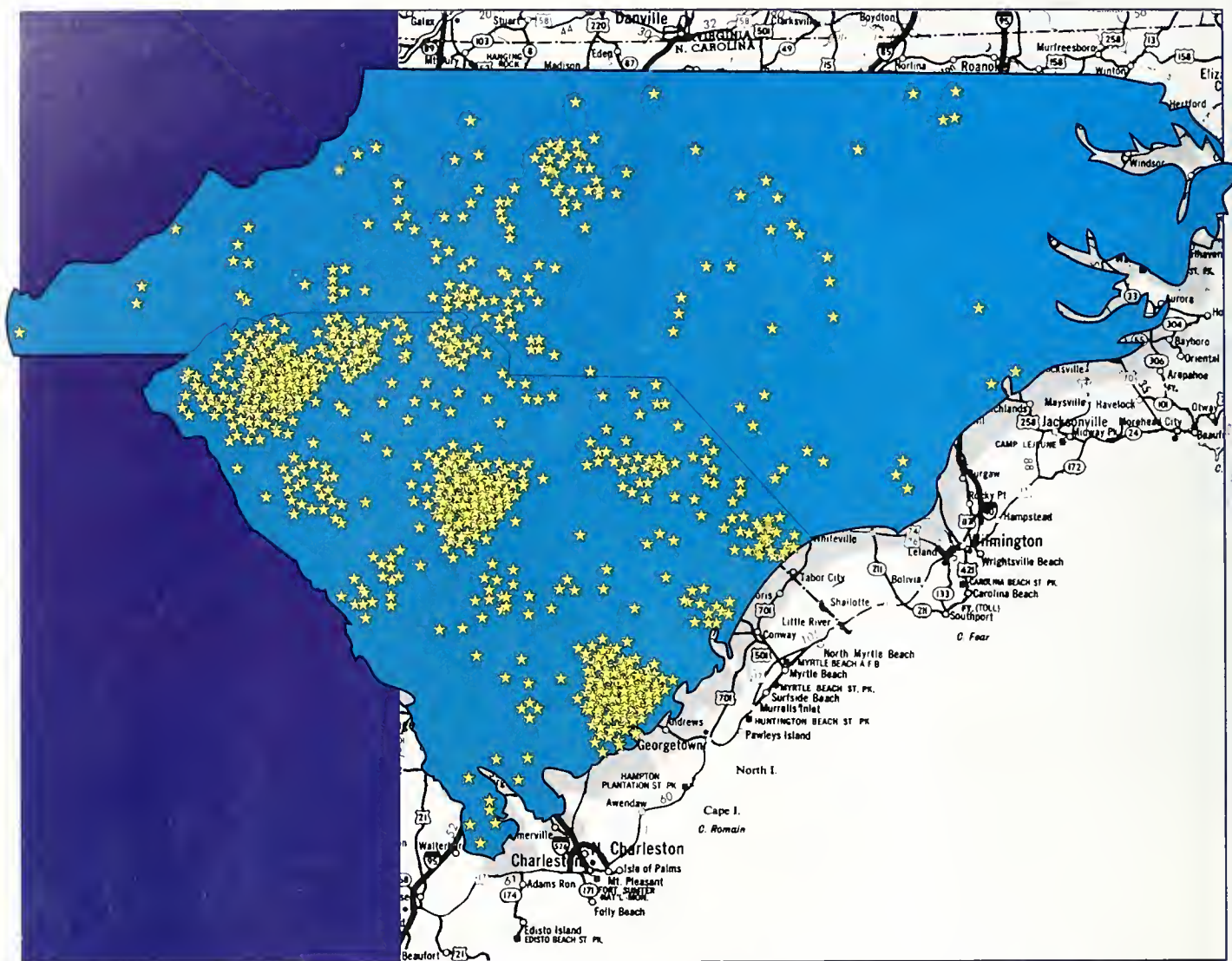
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North Carolina Medical Journal

For Doctors and Their Patients

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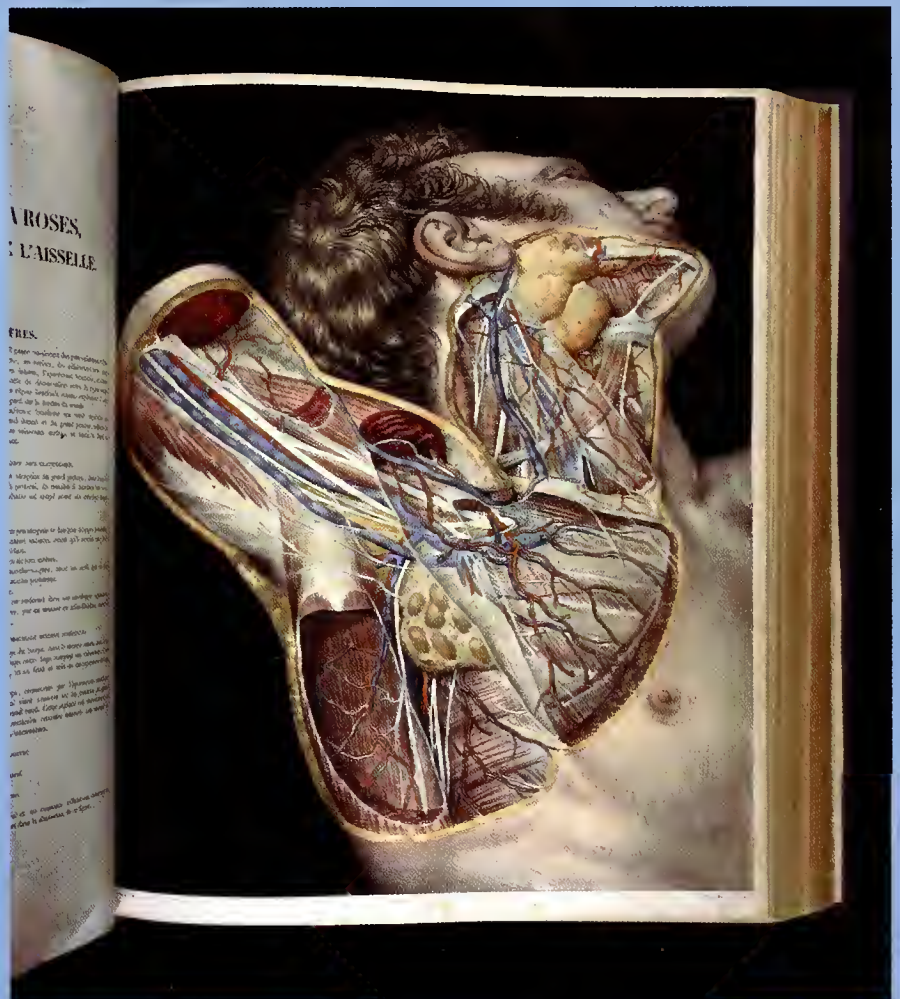
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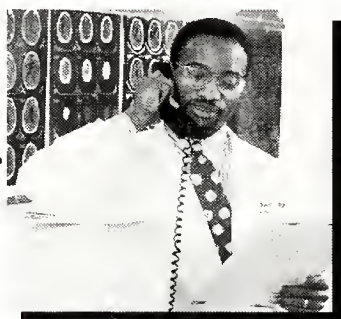
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For Doctors and their Patients

November/December 1999, Volume 60, Number 6

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—*Constitution and Bylaws of the North Carolina Medical Society*, Chap. IV, Section 3, pg. 4.

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North Carolina Medical Journal

FOR DOCTORS AND THEIR PATIENTS

November/December 1999 Volume 60, Number 6

Cover: One of 726 hand-colored lithographs in the eight-volume *Traité complet de l'anatomie de l'homme* (1831-54), compiled by Parisian physician Jean-Baptiste Marc Bourgery in collaboration with the artist Nicolas-Henri Jacob. This volume, from the historical collection of the Wake Forest University School of Medicine, is one of more than 100 items on display in an exhibit of medical art from four NC medical schools. See the article on page 328.

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Letters to the Editor



Prostate Cancer—Routine Screening or Not?

To the Editor:

Dr. Patel's patient handout in the September/October issue (NC Med J 1999;60:275-7) appears to contain an error regarding current recommendations for screening for prostate cancer. To my knowledge, the current recommendation of both the American Cancer Society and the American Urologic Association is that patients discuss the pros and cons of screening with their physicians and make their own decisions. This is a significantly "softer" stance than the formal recommendation in favor of routine screening that Dr. Patel indicated in her handout.

Steve Magee, MD
Concord, NC
stevenlisa@ctc.net

Family Practice—Clinical Research and Care Too

To the Editor:

Francis Neelon has written a classic description of the attitude of caring as the essence of family practice (NC Med J 1999;60:211). His essay should be read by every family physician and especially by every family practice department chairman, faculty, and resident.

I hasten to add that Dr. Neelon's attitude of caring is in no way a contradiction of my contention that for family practice departments to cease being considered intellectually second-class citizens in the medical school, we need to do disease-specific research. Sexually transmitted diseases and pathophysiologic processes that originate in relationship dysfunctions can be more effectively researched and defined in the family practice setting than in fragmented disciplines. But, again, it's the attitude that counts.

John R. Dykers, Jr., MD
PO Box 565
Siler City 27344

Journal Article on Center for Child and Family Health—Everybody Wins

To the Editor:

I want to congratulate you and thank you for publishing the excellent article by Thomas E. Frothingham, MD, and

associates, "Center for Child and Family Health—North Carolina: What Is It? And Why?" (NC Med J 1999;60:83-9). The article provided very useful information to physicians throughout North Carolina about a valuable resource we are lucky to have in our state.

In addition, having an article about the Center in a prestigious journal has helped greatly in the Center's ability to attract and maintain grant support. Potential corporate and individual donors are impressed by this account.

I see this as a winning situation for all involved—information for North Carolina physicians, help for abused children in North Carolina, and help for the Center's ability to attract and maintain financial and community support. Keep up the good work. This is exactly the kind of article that makes the North Carolina Medical Journal important and unique.

Gloria (Mrs. Robert H.) Wilkins
3920 Dover Road
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More About Prostate Cancer—Expectant Management versus Treatment

To the Editor:

With regard to the recent article on expectant management of prostate cancer (NC Med J 1999;60:261-7), I would like to congratulate Dr. Griffin and O'Rourke for a thorough and concise review of a complex and difficult issue.

As indicated in the article, there are no good randomized trials demonstrating the efficacy of treatment versus expectant management for carcinoma of the prostate. As a result, numerous agencies have recommended against routine PSA testing. Nevertheless, many clinicians have rejected this recommendation and prostate cancer screening has become widespread in this country. In fact, two prostate cancer screening clinics were held in Durham during the very month in which this article appeared.

The authors do not mention that recent non-randomized data, such as that from Olmsted County, Minnesota, suggest a decline in mortality from prostate cancer. These data would suggest that screening practices that have been adopted in this country may actually prove to be beneficial, despite the lack of prospective randomized data to support this practice.

This situation is analogous to that of cervix cancer, in which, to my knowledge, there has never been a randomized trial demonstrating the benefit of pap smears. Nevertheless, the routine adoption of screening for cervix cancer has resulted in an undisputed drop in mortality from that disease.

While the authors do discuss rates of progression and development of distant metastases in patients who choose observation, they do not really indicate what percentage of these patients would ultimately require treatment for their progressive disease. In most cases this treatment would be androgen deprivation therapy, since presumably treatment would be withheld until patients became symptomatic. However, androgen deprivation therapy is not a "free lunch," and it is associated with its own constellation of side effects, including hot flashes, anemia, muscle wasting, and osteoporosis. Nevertheless, a significant portion of patients treated definitively with either radiation therapy or radical prostatectomy will require subsequent treatment for recurrence. The available clinical data, however, suggest that those least likely to recur are those treated at the earliest stages.

Finally, the authors recommend that patients most appropriate for expectant management are those with clinically confined disease, low Gleason scores, and a life expectancy of 10-15 years or less. Unfortunately, we are not very good at determining whether or not a tumor is organ-confined; most patients with newly diagnosed prostate cancer (median age around 65 years) will have a life expectancy of at least 10-15 years, and low Gleason scores based on biopsy specimens are often upgraded on radical prostatectomy specimens. We need better means to determine biological aggressiveness of a particular cancer. Hopefully, advances in molecular biology and genetics will, in the near future, provide us with those tools.

Mitchell S. Anscher, MD
Department of Radiation Oncology
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Box 3085
Durham 27710

To the Editor:

I would like to offer a few comments on your recent article on expectant management of prostate cancer (NC Med J 1999;60:261-7).

Expectant treatment of low-grade, low-volume adenocarcinoma of the prostate in elderly patients has been well received by the urology community. Careful selection of this specific patient population is most important. Extending this method of management to a younger patient population may be questionable, as there may be a focus of higher grade tumor in the prostate gland that was "missed" by the initial biopsy because of a sampling error in the sextant form of biopsy most commonly performed by urologists.

To increase the yield and to decrease the possibility of inadequate sampling of the prostate tissue at the time of a

biopsy, additional small cores of tissue could be obtained. However, these biopsies are performed with little anesthesia in the urologist's office, and additional biopsies (more than six) can add to the patient's potential discomfort.

The biology of prostate cancer unfortunately is varied in the tissue as the cancer develops. Thus it is not unexpected to find more than one grade of prostate cancer in the prostate at a given time. Because of this, sampling errors may occur from time to time.

Donald T. Lucey, MD
Wake Urological Consultants
2000 Blue Ridge Boulevard, Suite 403
Raleigh 27607

A Ruling on Required Exposure to Pepper Spray—et Sequelae

To the Editor:

I write to call to your attention the erroneous statement contained in the article "Health Hazards of Pepper Spray" appearing in your September/October issue (NC Med J 1999;60:268-74).

The case to which you refer is entitled *Ryder v. Freeman*, and my Memorandum of Decision is reported at 918F. Supp. 157(1996). Before the case could be heard by the Fourth Circuit Court of Appeals, the plaintiff, Ms. Ryder, submitted to the pepper spray exposure requirement to which she had objected. Over Ryder's objection, the Fourth Circuit dismissed the appeal as moot, there no longer being any case or controversy to review. *See*, 112 F.3d510 (table), 1996 WL 880607 (4th Cir. 1996). For the same reason, the judgment was ordered vacated. At no time did the Fourth Circuit address the case on the merits or reverse the judgment I entered.

Lacy H. Thornburg
Judge, US District Court
Western District of North Carolina
100 Otis Street
Asheville 28801

The Authors Reply:

We thank Judge Thornburg for clarifying the disposition of the *Ryder v. Freeman* case by the Fourth Circuit Court of Appeals and providing the actual wording of the opinion. The basis for our statement that his decision was reversed by the appellate court was obtained from page 40 of reference 29 (Doubet M. The medical implications of OC sprays, 1997), which states, "Ryder appealed the decision and on October 29, 1996, the US Court of Appeals for the Fourth Circuit reversed Judge Thornburg's decision."

The copy of the disposition and opinion included with Judge Thornburg's letter indicates that the disposition is unpublished and contains the wording, "NOTICE: THIS IS AN UNPUBLISHED OPINION." Having reviewed the reference upon which we relied and the disposition and opinion

provided by Judge Thornburg, it is now clear to us that *Ryder* appealed his judgment and *Freeman* (Secretary of the NC Department of Corrections) filed a motion to dismiss *Ryder's* appeal on the basis of mootness. According to the opinion, the Fourth Circuit granted *Freeman's* motion and dismissed *Ryder's* appeal "as moot because in the interval appellant [*Ryder*] had submitted to the pepper-spray exposure requirement which her action had sought to enjoin." The opinion goes on to state, "In responding to and resisting the appellee's [*Freeman's*] motion to dismiss on mootness grounds, the appellant moved that if the dismissal motion was granted, this court should remand the action with instructions to the district court to vacate its judgment . . ." The Fourth Circuit granted *Ryder's* motion and ordered that "in conjunction with dismissal of appellant's appeal as moot, this action is re-

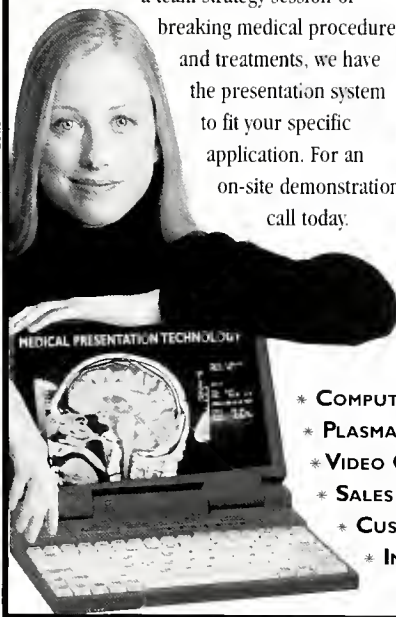
manded to the district court with instructions to enter an order vacating its judgment of February 22, 1996."

In summary, *Ryder's* appeal of Judge Thornburg's ruling in *Ryder v. Freeman* was dismissed and Judge Thornburg's ruling was vacated (made null and void), not reversed as we stated, by the Fourth Circuit. In reviewing this issue, we also contacted Ms. Ryder. After submitting to pepper-spray exposure as a requirement of her job, she was evaluated for blepharospasm and eye pain and was treated for chemical conjunctivitis under Workers' Compensation. For other medical reasons, she is now on disability retirement from the NC Department of Corrections.

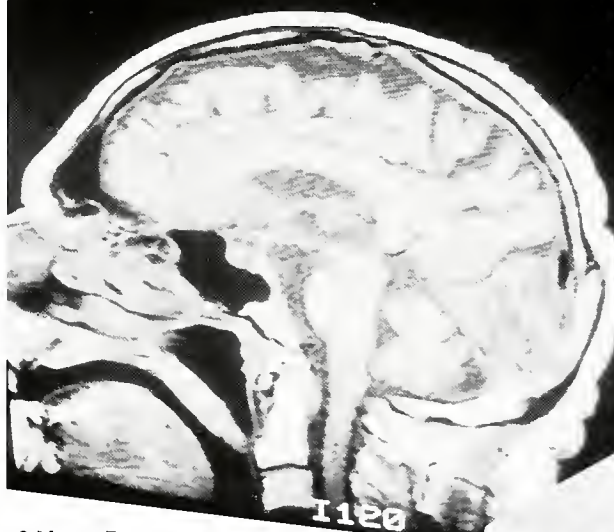
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NC Med J for Y2K

Francis A. Neelon, MD

The *Journal* is pleased to say its fund-raising efforts over the past 10 months have been successful enough to cover our publication expenses through at least the year 2000. The editors and the Editorial Board thank all those individuals and foundations whose generosity and foresight has sustained us. Of course, the job is still far from done, and efforts to secure our future will continue unabated. It is the expressed wish of the Medical Society's present leaders that no part of the annual membership dues be used to underwrite publication of the *Journal*. So, for the time being at least, we must continue to rely on contributions from individuals and grants from charitable organizations. Readers who want to help insure the *Journal's* future into the next millenium may send tax-deductible contributions to the North Carolina Medical Society Foundation at PO Box 27167, Raleigh 27611.*

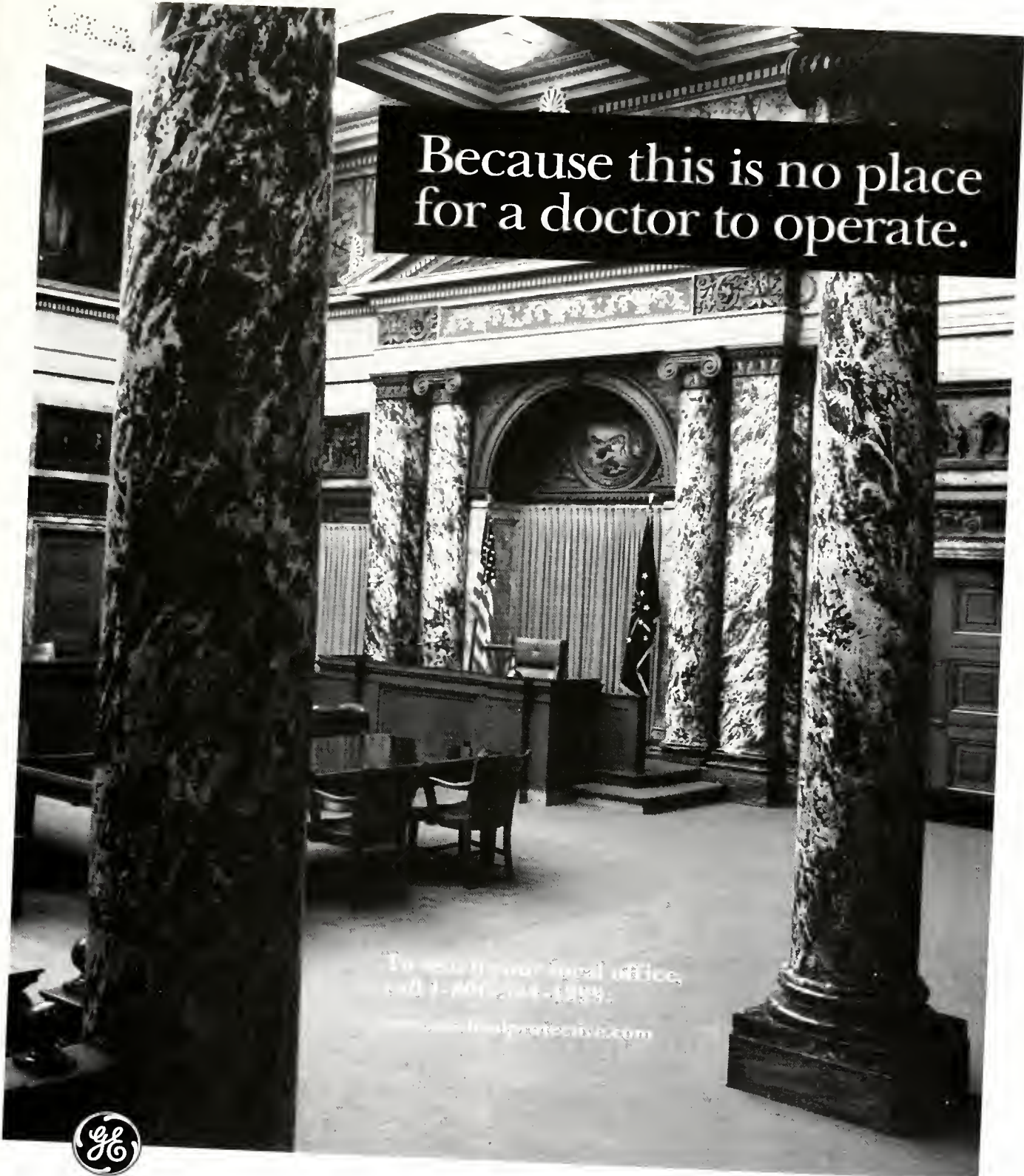
There is some other news to report. Last spring, President Carl Rust appointed a Task Force, chaired by Henry Carr, MD, to look at how the Society could continue to publish the *North Carolina Medical Journal* over the long term. Several options were explored and found wanting. Commercial publishers were asked whether they were interested in taking over publication of the *Journal* as a commercial venture; all declined, citing the lack of foreseeable financial profit (even if the format were entirely redesigned to offer a very different and more "sellable face" to the readership). Nor does there seem to be any reasonable hope that increased advertising dollars will cover publication costs. The *Journal's* advertising revenue has been falling gradually for many years, just as it has at virtually all medical journals. Drug companies, once the mainstay of medical publishing, have clearly reoriented their advertising efforts away from physicians in favor of direct advertising to patients. I suspect that this is yet another way in which the advent of managed care impacts the medical profession. Non-pharmaceutical advertising remains a possibility, but the very smallness of the *Journal's* account means that few representatives — who might aggressively pursue new advertising accounts — are interested in us.

One item that did emerge from the Task Force's meetings was a clear call to explore an expanded presence on the Internet, with an eye toward the future possibility of abandoning the *Journal's* print publication and converting solely to publication on the World-Wide Web. The *Journal* already has

a presence on the Web, but we do not publish the entire contents of each issue, nor do we archive prior issues. We will start doing both those things as soon after January 1, 2000, as we can get the proper equipment and in-house expertise. There are some very attractive features to Web-based publication. At present, we spend about \$65,000 a year to print and mail 11,000 copies of each issue. Putting the same material on the Web would cost a small fraction of that amount. Furthermore, a Web-based journal would be available to all interested readers, anywhere in the world. It would be possible to monitor and respond to reader interest in *Journal* offerings in ways that we cannot now do. Finally, the expertise we will develop by putting the *Journal* on-line might be of use with other of the Society's other publication needs. Of course, there are many unknowns that need to be resolved, such as what will happen to our listing in *Index Medicus*, how will we archive previous issues of the *Journal*, how will Society members with no access to the World-Wide Web get the *Journal*, and will anyone want to read on-line a "browsing" journal such as we are? These are all issues that we will be tackling over the next twelve months.

For now, the good news is that we will still be here — and with your help will be for longer than just one more year. Several members have pointed out the great advantage of having an endowed fund, dedicated to the support of the *Journal*, which would support publication permanently. That sort of financial stability would be a great boon to the Editorial office, and would remove a source of financial worry from the Society office. It is still not clear that we can raise the large sums of money (on the order of \$2 million) needed to sustain such an endowment, but it is certainly something worth our consideration. A real endowment would allow the *Journal* to stand as a gift from the North Carolina Medical Society to all of medicine in North Carolina, preserving the legacy of medical practice here, and serving as the cement that bonds medical practitioners into a real profession. You will hear more from us about this in the future. □

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Getting Our Bearings

Francis A. Neelon, MD

I am impressed that, when the time is right, the same kind of “new” thoughts bubble to the surface of different human brains. Two or more individuals seem to think the same thoughts at the same time. These seemingly novel ideas do not arise *in vacuo*, but because the flow of time’s events lead different observers to the same place. I am convinced that if Newton and Leibnitz, each working alone and hundreds of miles apart from each other, had not simultaneously invented the calculus, someone else would have. Because the time was right.

The ferment imposed on medical practice by economic forces (symbolized by, but not at all restricted to, “managed care”) has begun to produce a counter-revolutionary rhetoric. The good news is that the dialogue now taking place asks doctors to look deeply at what they do and why, to look at the pernicious effects of money and more money on the fabric of medicine. When Aneurin Bevan was asked, after the end of the World War, how he would overcome the resistance of GPs opposed to his nationalization of British health services, he is reputed to have said, “We will stuff their mouths with money.”

All of us would agree that there is more to medicine than the mere making of

money, but the rapid rise of doctors’ incomes over the last 50 years sometimes has obscured that fundamental truth. Now doctors are speaking out against the strictures of business-oriented medicine and in favor of our real goals. We need those balancing voices to bring us back to our purposes, and we need to hear them often.

In this issue of the *Journal*, we present three brief essays touching on this theme. Claude Frazier, who has favored us in the past with papers on his cat, *Sweet Thing*, and his late-life adventures hang-gliding, writes now of how retirement took him unawares—in part stimulated by the changes imposed on his practice by managed care.

Charles Willson, the Society’s Secretary-Treasurer and a Greenville pediatrician, reminds us of the call to service that is the primary reason for doctoring.

And psychiatrist Assad Meymandi points out the ancient roots of the medical ethos and suggests that today’s profession has lost its sense of self—a condition analogous to the schizophrenia he is so familiar with from his medical practice. Fortunately, his prescription for us is not tranquilization but activation, a call to rediscover our roots and the real reasons that Medicine exists.

Professionalism

The Medical Ethic Versus the Business Ethic

Charles F. Willson, MD

In our society, the term "professional" has come to mean someone with extraordinary skill who makes a living using that skill—for example, professional athletes. The Hippocratic tradition, however, has given professionalism a much more specific meaning. Medical professionals are those who

- have extraordinary knowledge and skill in specific fields;

- have promised to help other, vulnerable human beings;
- have assumed the obligation to hold others' interests above their own.

Contrast that with the "business ethic" of providing a quality product or service at a competitive price. Success in business is measured in terms of profit. There is no dishonor in making a profit unless it is by taking advantage of the customer's vulnerability. Recently, here in Greenville after the flood, some businesses tried selling six-packs of bottled water for \$30-40. The community reacted by setting up free water distribution sites, thwarting those who had hoped to make quick profits out of other people's misery. Such are the risks of the business ethic carried to its worst extreme.

Much of the present confusion inflicted on medicine by managed care can be traced, I believe, to the shortsighted application of a business model to the practice of medicine. Physicians, together with pharmacists, optometrists, speech therapists, chiropractors, etc., become "providers." Our patients then rightfully ask whether our actions are for their benefit or for our financial gain. The latter conclusion is reinforced by the stereotype of the doctor with the most expensive car in the parking lot, playing golf on Wednesday afternoons. Add in the real fear of our patients that serious illness could well bankrupt them, and you can see why the profession of medicine is in trouble.

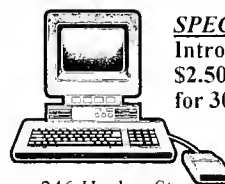
If we are to regain our patients' trust, we must reassert our professionalism. We must reassure our patients that they

can rely on our expertise, judgment, and compassion to help them through life's threatening crises. We must resist the temptation to bolster our bottom line by selling vitamins and health care products in our offices. We must resist the temptation to turn our offices into production lines, whisking patients past mid-level providers, simply to increase profits. We must be willing to sit and listen to our patients as they ask their questions and tell us their fears. We must be there when they need us. As a referring physician, I must know that the doctor to whom I am sending my patient shares my professional vision. If we can return to professionalism, our patients will honor us, and join us in exposing and denouncing unethical business practices in health care. □

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Dr. Willson is associate professor of pediatrics at East Carolina University School of Medicine in Greenville. Currently he serves as Secretary-Treasurer of the North Carolina Medical Society. He can be reached at cwillson@pcmh.com.

The Malaise of Millennial Medicine

Assad Meymandi, MD, PhD, LFAPA

Western scientific and philosophical thinking—in medicine and other disciplines—has roots in ancient Greece, Rome, and Persia. Aristototle, Hippocrates, and Galen gave us a systematic approach to taxonomy, classification, and diagnosis (a word coined by Hippocrates from *dia*—through, and *gnosis*—knowledge) of disease, as well as setting the foundation for medical ethics and clinical medicine. At the turn of the first millennium, the Persian clinician Abu Ali Sina (Avicenna) introduced the specialty of infectious diseases by describing the major contemporary killers of children: chicken pox, measles, mumps, and scarlet fever.

After the Dark Ages, the Renaissance invigorated the arts and philosophy, but frankly did not do much for medicine. Only with the 18th-century Enlightenment did western medicine catch fire. Enlightened physicians such as Benjamin Rush, a signer of the United States Constitution, gave medicine the impetus for enormous and unprecedented professional expansion. Professional societies like the American Medical Association and the American Psychiatric Association were born roughly 150 years ago.

During the last century, the most important innovation in health care was the establishment of preventive medicine and public health. Throughout the first half of the 20th century, improvements in water supply, personal cleanliness, living conditions, and immunizations did far more for longevity than any other element of medical practice. Many of these reforms were carried out on a community level by the local doctor. This helped make the doctor the most trusted, most respected, and most beloved member of the community.

Today, however, the community doctor has been turned into a "health care provider," a title of dubious merit shared by a huge cadre of non-physicians, including chiropractors, naturopaths, herbalists, nurses, acupuncturists, psycholo-

gists, social workers, pastoral counselors, and optometrists, to name just a few. Dilution of the scope of medical practice has been a powerful force in obfuscating the very definition of "doctorhood." Physicians have become victims of uninformed, uneducated, and economically driven decisions promulgated by a brigade of red-tie, blue-suit, buttoned-down MBAs. Operating with only the most superficial understanding of the elements of health care, these entrepreneurs have created a system of managed care—maybe better called managed costs—to serve themselves and their shareholders. I recently reviewed the US Department of Commerce's 1997 data on salaries of the CEOs at major national HMO companies. The average compensation—salary, bonus, stock option, and benefits—came to eight million dollars a year!

The Lesion and Its Pathogenesis

Let us use a phenomenological scalpel to explore today's medicine. I am sorry to say that the profession as we have known it is very ill, maybe even on its death-bed. The revered physician of the first half of this century was long on compassion, altruism and generosity, even if short on scientific information. There was less concern then about the collection of fees, less attention given to the economic aspects of the practice of medicine. Those of us old enough to have been in practice before the mid-sixties, routinely saw and treated, *gratis*, patients with no insurance or money. Seeing and treating indigent patients was just part of a physician's practice. It was a given. Caring for and serving patients and their families was the primary concern of the profession.

The advent of federally funded Medicare Part A and Part B and state-funded Medicaid logarithmically increased the tabulated costs of health care. For the first time, doctors and hospitals were paid for services that they previously had donated. The cost of health care rose from 6.5% of the gross domestic product (GDP) in 1964 to 14% in 1992. Almost overnight, hospitals of palatial proportions sprang up through-

Dr. Meymandi, a Trustee of the NC Medical Society Foundation, practices general, geriatric, and forensic psychiatry in Raleigh. He can be reached at 3320-218 Executive Drive, Raleigh 27609, or AMMDFAPA@aol.com.

out the nation — each with its own complement of the latest, state-of-the-art CAT, PET, SPECT, and MRI scans. The income of doctors sky-rocketed. The Health Care Financing Administration's 1992 Annual Report predicted that health care cost might reach 20% of the GDP by 1996. This sounded the alarm: the cost of health care had to be contained. Cost considerations fostered the rapid emergence and burgeoning of the managed care industry. I believe that the primary reason for the dilemma faced by today's practicing doctors is the financial excesses of the 1970s and 80s — those same "golden years of medical practice" to which we often longingly refer.

The state of medicine in America today reminds me of the clinical evolution of schizophrenia. Medicine has lost its ego boundaries and become confused as to self and identity. The doctors at the turn of the millenium do not know who (or what) they are. They have lost their autonomy. In order to carry out the medical decisions they have made with their patients, they must first call an insurance company to seek the "approval" of some unseen clerk with a high school degree. In addition, physicians' role dyscrasia, their current uncertainty about what was once a constant and reliable source of security, produces enormous anxiety for doctors. The patient, formerly a trustful partner in a gratifying relationship, is often seen now as a potential instigator of litigation and snitching.

Doctors have lost their footing. They are awash in a turbulent sea of uncertainty, anger, anxiety, and doubt. They have no compass. There is no gyroscope. The winds are getting stronger. The night is turning darker. And there is no beacon on the horizon. Organized medicine is perceived to be ever more irrelevant, and thus weaker, in the face of an economic tsunami.

What Can We Do?

In the mid 1960s, Medicine was derailed from its honorable course by economic forces. I believe it can be put back on track. Physicians, by and large a dedicated, learned, and compassionate group possessed of abundant intelligence and ability to make quick decisions, must do what they know and are trained to do: practice their profession, advocate for their patients and colleagues, and renew their reverential devotion to Hippocratic principles. We cannot allow medical ethics to be replaced by medical economics. Physicians — and only physicians — have the knowledge and skill to make differential diagnoses. Today's physicians have the opportunity of returning to their roots in 18th-century enlightenment, while retaining the enormous knowledge and technology of the 21st century. What a privilege! Now we need to act on it. □

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Sneaking Up on Retirement

Claude Frazier, MD

The word "retirement" was never in my vocabulary. Perish the thought of not knowing what I was going to be doing every minute of every day. I have never liked the idea of idle time. I wanted something to do every waking minute. Being a physician probably helped shape this way of thinking. Certainly, I never relished the idea of retiring. "Golden age?" Not for me. More like a jail sentence!

A few years ago, though, I began to have some problems with my knees. I continued my regular schedule, rode the stationary bike, swam, went to the office, played tennis in the evenings. This was a daily ritual until well past my 75th birthday. But when the day came that I could no longer play tennis, the game I loved so dearly, reality hit me with a bang. Somehow, it was happening to me just as to everyone else: age was taking its toll!

To take up the slack left by abandoning tennis, I just wrote and read more. Fortunately, the appetite for learning came early and has never left me. I am interested in science, in medical advances, in what the President did today, in how the stock market is doing. And I needed to keep on working because I had an office staff who had been with me more than 25 years. They might have trouble relocating — or was it that I didn't want to lose them because they knew my every thought? knew what I liked and did not like? knew not to offer me okra or tomatoes? I told them everything. We were like family. Clearly, they needed me.

My wife and I were never blessed with children, so I considered it a privilege to do something for my employees' children. I enjoyed talking with them when they came by the office to see their mother. They would stick their heads in the door and say, "Hi, Dr. Frazier. Are you feeling good today?" My insurance secretary loved animals—horses, dogs, cats, and everything in between. She took care of my cat, Sweet Thing (NC Med J 1999;2:67 [letter]). She would brush him and hunt for him if he disappeared. Another secretary could

read my moods. If I came in and stopped and said "Good morning," they all knew I had gotten up on the right side of the bed. If I slammed the door, she said I had made my "John Wayne entrance." On John Wayne mornings, this secretary teased me until soon the day would be going fine. You see how they all needed me?

I have always had a hankering to teach. I was offered some positions, but my schedule would never allow enough free time. So when the office staff came in for a meeting, I would go over the newest medical advances and even talk about problems with my sister or brother. The office staff would offer some very good solutions. My nurses always tried to make my work easier. "Now, Dr. Frazier, Mrs. Jones in Room 5 is not feeling very well. Her husband is sick." This helped me to be more attentive to Mrs. Jones since life was not kind to her at the moment. A nurse would hold up a cake and say, "Look what Mrs. Smith brought you." And then, "I know, Dr. Frazier: we can have a slice, but it has to be razor-thin." So, you see, there was no way I could in good conscience leave my practice and all these people who needed me so much! I felt great physically, even if I was occasionally nudged by some part of my brain that said I should think about that bad word, *retirement*.

To help me along, the era of managed care arrived with its maze of changes and regulations and documentations. I had to grind out mountains of paper to prove to some distant company that what I did in taking care of my patients was in fact good medicine. So I decided to work an hour less each day, restricting my patient appointments to mornings and early afternoons. Now I had time to swim in the afternoon. Not bad: a good swim and still there was time for reading, supper, and telephone calls. Looking back, my retirement was slowly beginning, but I would never admit it to myself.

My wife and I started going on trips, but I had my office staff forward my mail by next-day airmail. I was addicted to the mail. I couldn't make it through the day without it. Throughout my career I had been writing, and I relished the unique "high" that comes with a letter from a publisher: "Dear Dr. Frazier, your article has been accepted . . ." Then

The practice from which Dr. Frazier has successfully managed to retire is as an allergist. He still gets mail from his office, though: Doctors Park, Bldg. 4, Asheville, 28801.

we took the excursion to Alaska, a two-week trip by train. When I realized I couldn't get my mail on the train, I nearly didn't go. But my wife convinced me that I could live for two weeks without mail. I could even call the office at selected stops to keep abreast of what was happening. Well, I did survive. Back in town and still alive! I had made it! This was one of the factors that made me think maybe, just maybe, I could survive retirement — if I ever decided to retire, of course.

It kept coming to me that I had promised myself I would retire before I was 80 years old. I could still write articles. I had two books in the works for publication. Then I got an offer: an allergist wanted to buy my practice. For every objection I brought up, a perfectly reasonable solution was available. Still I did not want to "retire" right away. I set the date for April 15, 1999. Not only was that the day the IRS would be looking for my 1040, it was my birthday.

The rest is history. We've all survived — my wife, my office staff, and I. In part, I attribute my survival to "plunging" into retirement in a series of steps. I started the process almost without knowing I was doing it, and I lingered at each "new frontier" until I was comfortable being there. Sure, I still miss my patients and my office. Lonely? Not exactly, but

I still crave the attention I got from the staff who needed me so badly. But—can you imagine?—they seem to be doing right well without me. The other day I invited them all out for lunch at the club, and they all showed up. We had a good time, though I noted that they still need me enough to let me do all the talking.

I can truthfully say that, once I decided to (*shhh!*) retire, everything fell into place so smoothly it was almost scary. I can finally recommend this stage of life as a good one—not yet "golden," but getting there. Every day is a new day. I am hearing and seeing things that I never had time to enjoy before. Have you ever looked out the kitchen window and watched the squirrels play? They act like they are talking to one another. Did you know that before it rains the leaves on the trees turn their backs to you?

Yes, I still swim. I read all the major newspapers, all the medical journals, send in "letters to the editor," and travel. In fact, anyone who needs to reach me will have to hold off for two weeks: I'll be aboard the American Orient Express (Vancouver, British Columbia, to Montreal, Quebec). As William Allen White said, "I am not afraid of tomorrow, for I have seen yesterday and I love today." □



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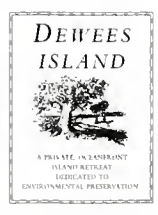
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If I Had a Retained Common Bile Duct Stone . . .

John Baillie, MB ChB, FRCP(G)

What is a "retained common bile duct stone?"

The American Heritage Dictionary says that *retain* means "to hold in one's possession." Applied to a stone in the common bile duct (CBD), "retained" suggests that the stone was present before an unspecified but understood cholecystectomy. It means the stone did not arise *de novo* within the biliary tree. We assume that most if not all retained CBD stones "started life" in the gallbladder. Gallbladder stones can and do migrate regularly from the gallbladder, through the cystic duct, into the CBD, and thence (usually) into the duodenum. We know from studies of stones pulverized by extracorporeal shock wave lithotripsy (ESWL) that stones (and stone fragments) as large as 7mm in diameter can pass into the bowel without causing any symptoms. We also know that stones as small as 5mm or less can cause a great deal of misery in the form of biliary colic, cholangitis and gallstone pancreatitis.

Somewhere between 10% and 15% of patients who have normal liver tests, non-dilated bile ducts, and no signs or symptoms of choledocholithiasis at the time of cholecystectomy will have CBD stones found by intra-operative cholangiography (IOC). Although most of these small (<5mm) stones will pass spontaneously without incident, some do cause biliary obstruction and pancreatitis. A multicenter trial is about to start in the US to determine the risks of leaving small stones in the CBD, to pass spontaneously. Until we have evidence to the contrary, most surgeons feel that biliary stones detected during cholecystectomy should be removed. It is possible to remove CBD stones through a laparoscope in patients with suitable anatomy, but there has not been much enthusiasm for this approach in the US. Since endoscopic

retrograde cholangio-pancreatography (ERCP) is widely available, most of the CBD stones identified at operation are later removed by gastrointestinal (GI) endoscopists, with or without biliary sphincterotomy (Figure 1).

How should we look for retained CBD stones?

In the present era of laparoscopic cholecystectomy, it is particularly important for surgeons to know about CBD stones pre-operatively, so that they can plan management. Using a variety of statistical "instruments," it is possible to estimate the likelihood that a given patient has choledocholithiasis. A nomogram can be constructed using the values of serum aspartate (AST) and alanine (ALT) aminotransferases, bilirubin, CBD diameter (determined by transabdominal ultrasound examination), etc. (Figure 2) For example, a patient with normal serum aminotransferases and bilirubin and a CBD diameter of 5mm would have a 5-10% risk of having CBD stones.

When laparoscopic cholecystectomy was first introduced, surgeons were keen for endoscopists to perform pre-operative ERCP on every patient, both to look for stones and to define the biliary anatomy. Pre-operative ERCP is justifiable and appropriate in patients with obstructive jaundice or cholangitis because retained stones are found in more than half of such patients, but "routine" ERCP is not cost-effective and itself poses the risk of complications, especially pancreatitis. Post-ERCP pancreatitis usually runs a fairly short and ultimately benign course, but some patients develop severe pancreatitis resulting in prolonged hospitalization and, rarely, even death.

At Duke University it is our policy to send patients with low predicted risk of CBD stones directly for laparoscopic cholecystectomy without prior ERCP. At the surgeon's discretion, IOC may be performed, and if stones are identified, ERCP is carried out the following day (before discharge

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home). This plan works well whenever the endoscopist is skilled at performing ERCP and has a high rate of success in cannulating the CBD. The difficulty comes when bile duct imaging is unpredictable. Surgeons do not want to perform a second operation (usually an "open" CBD exploration) because ERCP has failed. Fortunately, most endoscopists who perform ERCP can refer "failed cases" to a regional center of excellence. If the patient is not acutely ill with cholangitis, a day or two's delay in removing CBD stones does not adversely affect outcome. When there is no such support system, plans have to be modified to recognize the strengths and limitations of both surgeon and endoscopist.

Are there other, and perhaps less troublesome, ways to identify CBD stones before surgery? One possibility is *intravenous cholangiography* (IVC) in which an iodinated contrast agent, given intravenously, is taken up by the liver and excreted in the bile. Its use for pre-operative visualization of the biliary tree fell out of favor because of allergic reactions to the contrast material, but it has been revived and contrast allergy lessened. In expert hands, IVC produces good-quality images that are sensitive and specific for detecting CBD stones. However, I don't think that IVC will "catch on" in the US because of the medicolegal climate and the risk of costly law suits in cases where there is an allergic reaction to the contrast agent.

Another possibility is the use of magnetic resonance imaging (MRI) for non-invasive, contrast-independent imaging of the bile and pancreatic ducts. Magnetic resonance cholangiopancreatography (MRCP) is still in its infancy but shows great promise. The images produced are becoming more and more sophisticated, but for now MRCP still has difficulty detecting small CBD stones. It is certainly helpful in patients whose local anatomy (because of stenosis or prior surgery) precludes endoscopic access to the duodenal papilla. MRCP costs about the same as diagnostic ERCP, but if the cost can be brought down, I predict that MRCP will become the screening test of choice for patients suspected of having a "retained CBD stone."

Transabdominal ultrasound (US) is quite specific for choledocholithiasis (that is, a stone "seen" on US is very likely to be "real"). However, the sensitivity is probably not more than 60-70% in the best hands (so a negative scan does not mean there is no stone). Endoscopic ultrasound (EUS), on the other hand, is both sensitive and specific for CBD stones. Since EUS does not require the use of contrast or cannulation of the bile duct, it is not prone to cause pancreatitis. Some day quite soon, duodenoscopes will incorporate a small EUS transducer so that the operator can decide whether or not there are "stones or no stones" *before* committing to ERCP.

Percutaneous transhepatic cholangiography (PTC) is yet another way to image the biliary tree. However, it is the most invasive of the imaging techniques available, and runs the risk of bleeding and bile leak. Patients who have percutaneous biliary drains left after PTC often have significant dis-



Figure 1. Endoscopic retrograde cholangio-pancreatography (ERCP). Cholangiogram with multiple filling defects in the common bile duct (stones).

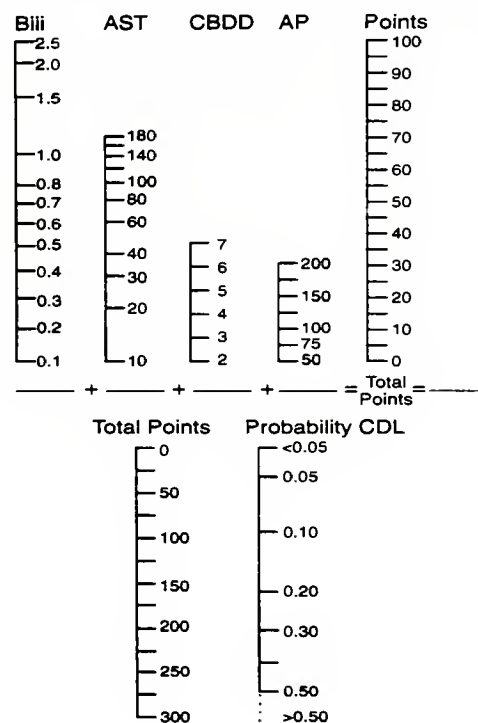


Figure 2. Nomogram to predict likelihood of common bile duct stones using serologic tests and bile duct diameter. Onken et al. Am J Gastroenterol 1996;91(4):762-7. By permission.

comfort at the drain site. PTC is usually reserved for patients who have failed other imaging techniques, and are expected to need external biliary drainage to decompress an obstructed system.

If I had a CBD stone, what would I want done?

Well, this would depend on how big the stone was and what symptoms I had. Given my disinclination to let anyone but me perform ERCP on me, and knowing how bad the post-ERCP experience can sometimes be, I would probably leave a solitary, small (<5mm) CBD stone alone because the odds favor spontaneous passage without incident. However, leaving a collection of small stones would be tempting fate, for one of them (at least) will almost surely give me an attack of biliary colic or pancreatitis. I would agree to having them removed by ERCP, hoping that my endoscopist would at least think about whether small stones could be removed without sphincterotomy (thus preserving the sanctity of my sphincter of Oddi and bypassing the early and late complications of this procedure). I would forbid the performance of a balloon dilation of the papilla (so-called balloon sphincteroplasty) because it is too dangerous. In a US multicenter study, two patients died of pancreatitis related to balloon sphincterotomy. No one should risk death to have CBD stones removed!

If my retained stone caused biliary obstruction, I would certainly want it removed to decompress the system (and urgently if cholangitis was present). If the stone had caused gallstone pancreatitis, I would request urgent ERCP/sphincterotomy but only if the pancreatitis was clearly associated with progressive biliary obstruction or sepsis. I do not believe that we can justify endoscopic intervention in patients with no evidence that the ampulla of Vater is obstructed by the offending stone. The interesting and provocative work of Nowak et al in Poland suggests that all patients with gallstone pancreatitis should have ERCP within 24 hours of symptom onset; however, their studies have so far only been published in abstract form, and so it is difficult to know exactly how to interpret their conclusions.

Having myself used ERCP to remove some very large stones indeed from the biliary tree, I would want that tried before sending me (or any patient) for open exploration of the bile duct (or percutaneous radiologic intervention). Endoscopists have a number of tools for dealing with difficult stones, including contact and mechanical lithotripsy. ESWL is still available in some centers, and can be helpful if the stones are very hard, but ESWL usually commits the patient to a minimum of two ERCPs—one to place a nasobiliary drain (after failed stone extraction) and the second to recover stone fragments. Depending on the device used, the patient may require general anesthesia because ESWL can be pain-

ful. Many patients with large, difficult-to-extract biliary calculi are elderly and have many other medical problems, so use of ESWL may be arduous and drawn out. I sometimes leave biliary endoprotheses in place to ensure bile drainage in patients who are too frail to undergo repeated procedures. If the stones are mainly cholesterol, giving 300 mg of ursodeoxycholate (ursodiol) by mouth twice a day may soften the stones' surface enough to make extraction easier (but it rarely dissolves them).

I sometimes leave long-term stents in patients with CBD stones that cannot not be removed by any available means, but this is management of last resort. Very few patients these days need open surgery for retained CBD stones, although stone extraction combined with a biliary drainage procedure may be the treatment of choice in patients with multiple stones in a hugely dilated bile duct. And patients who repeatedly form and reform bile duct stones should be evaluated for a biliary bypass procedure. This usually cures the problem. □

Suggested Reading

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Running the Numbers

*A Periodic Report to North Carolina Physicians and Their Patients
About Current Topics in Health Statistics*

Paul A. Buescher, PhD, Editor

Pregnancy Statistics

Pregnancy terminations are reportable to the State of North Carolina in three main categories: live births, fetal deaths, and induced abortions. Babies born alive at any gestational age or birth-weight should have a Certificate of Live Birth completed. Approximately 99% of live birth records are filed electronically by hospitals to the Vital Records Branch of the State Center for Health Statistics. Fetuses born dead at 20 or more weeks of gestation, regardless of birth weight, should have a Report of Fetal Death completed. Paper copies of the live birth certificates and fetal death reports flow through the Registrars in county public health departments before coming to the Vital Records Branch. The large majority of induced abortions occur in about 15 clinics in North Carolina; for each abortion, these clinics send an Induced Abortion Case Report (without name or other identifying information) to the State Center for Health Statistics. The table below shows total reported pregnancies for North Carolina residents in 1998 by age of mother.

| Age of mother | Live births | Fetal deaths | Abortions | Total |
|----------------------|--------------------|---------------------|------------------|----------------|
| Less than 20 | 15,653 | 156 | 5,832 | 21,641 |
| 20-34 | 84,290 | 615 | 20,457 | 105,362 |
| 35 or more | 11,685 | 126 | 2,716 | 14,527 |
| Not reported | 3 | 8 | 863 | 874 |
| Total | 111,631 | 905 | 29,868 | 142,404 |

The live birth certificates, fetal death reports, and induced abortion case reports contain information such as mother's age, race, education, marital status, county of residence, and pregnancy history. This information allows portrayal of pregnancy rates and other statistics by characteristics of the mother. For example, the pregnancy rate for women ages 15-17 in 1998 was 54.1 per 1,000 women in this age group, compared to a rate of 156.3 for women ages 20-24.

It has been estimated that at least one third of all pregnancies result in miscarriage prior to 20 weeks gestation. These pregnancies are not captured through existing reporting systems in North Carolina. Adjusting for early miscarriages, the total number of pregnancies to North Carolina residents during 1998 can be estimated at 216,000. Whether very pre-term deliveries are reported as a live birth or a fetal death has important implications for infant mortality statistics in North Carolina. This issue will be addressed in a future article in this series.

**From the State Center for Health Statistics
www.schs.state.nc.us/SCHS
North Carolina Department of Health and Human Services**

Historic Representations of Medicine in Art

North Carolina Medical Centers Collaborate in a Rare Exhibition

Florence Nash, MA, AM

The realms of medicine and art have overlapped in important ways, to the benefit and enrichment of both. Tales are told of Leonardo da Vinci plundering graveyards, dissecting bodies by torchlight to see with his own eyes the precise arrangement of the skeletal structure and musculature. No less than painting and sculpture, medicine is a discipline of acute and sophisticated observation. The teaching and practice of medicine and surgery have relied to a great extent on the accurate visualization of anatomical relationships, the identification of medicinal plants, the illustration of manifestations of disease. As a consequence, museums and private collections around the world hold a rich accumulation of artifacts tying the history of medicine to the history of art—manuscripts, incunabula, amulets, anatomies, botanicals, sculptures, totems, tools, paintings.

It turns out that a surprisingly large number of these books, illustrations, and other valuable objects are contained in collections here in North Carolina, notably in the libraries and historical archives of the state's four medical schools. Until recently, apart from a few local displays, their existence has been a fairly well-kept secret; there has been no scholarly investigation of the combined holdings. Now, however, with the opening of *The Physician's Art*, a major

exhibit at the Duke University Museum of Art (DUMA), the public has a unique opportunity to become acquainted with some of these fascinating and beautiful examples of the symbiotic relationship between medical history and fine art.

The genesis of this exhibit came from Albert Heyman, MD, Emeritus Professor of Medicine at Duke University and head of the Irwin A. Brody Fund for the History of Medical Sciences. The Brody Fund was established in 1977 as a memorial to a Duke neurologist who was an ardent bibliophile and medical history buff. Initially under the guidance of G. S. Terence Cavanaugh, former curator of the History of Medicine Collections at Duke, and later led by Dr. Heyman, the Brody Fund has sponsored purchases of rare books for the Collections, seminars for North Carolina high school biology teachers, an annual history of medicine essay competition for North Carolina medical students and residents, a bibliophile society for Duke and UNC faculty, and a medical history society.

The History of Medicine Collections were first established in 1930 at Duke with the acquisition of the library of the Georgia Medical Society; they achieved real significance with the gift of the Josiah C. Trent Collection in 1956. In this outstanding collection, donated to the Medical Library by his widow, Mary Duke Biddle Trent Semans, Dr. Trent had assembled 4,000 books, including many first and rare editions of medical classics; more than 2,000 manuscripts; and a number of fine museum objects related to medicine. Included as well was an extensive store of medical bibliogra-



Figure 1. Bartisch: *Ophthalmodouleia*, 1583. Trent Collection, History of Medicine Collections, Duke University Medical Center Library.

As a member of the Brody Committee, Ms. Nash was an early participant in the planning of the medical art exhibit. She is also this Journal's Managing Editor.

phies, histories, and biographies essential to students, teachers, and researchers in the history of medicine. The History of Medicine Collections now comprise some 20,000 volumes including monographs, serials, manuscripts, medical instruments, artifacts, prints, photographs, and ephemera.

Two years ago, looking for a new project for the Brody Fund, Dr. Heyman approached Suzanne Porter, curator of the History of Medicine Collections, about mounting an exhibit of some of their holdings. The project gathered momentum over the course of a couple of preliminary planning meetings: Brody Committee members expressed a wish to undertake a project that would involve other medical centers; Ms. Porter knew from her counterparts in the state's other medical school libraries that there existed very interesting historical collections at these institutions as well. The idea of involving all four schools became more and more attractive, both because it gave larger scope to the exhibit and because it provided an unusual opportunity for a collaborative project.

By happy coincidence, medical historian Julie Hansen, whose specialty is the depiction of medicine in visual art, had recently moved to Durham. The Medical History Society hosted Dr. Hansen as a dinner speaker on the anatomy lesson in 17th-Century Dutch painting, on which topic she is currently writing a book. Presented with the challenge of curating the exhibit—including preparation of a scholarly catalogue—she accepted enthusiastically. After extensive discussions among Dr. Hansen, Dr. Heyman, Ms. Porter, and the staff at DUMA, the project was well under way and gathering momentum. DUMA's Director, Dr. Michael Mezzatesta, and Curator, Dr. Sarah Schroth, realized the potential importance and public interest of such an exhibit and offered substantial museum support. The Brody Committee set about trying to raise funds to cover expenses of the exhibit.

Meanwhile, Dr. Hansen and Ms. Porter visited the collections in the medical libraries at Wake Forest, UNC-Chapel Hill, and East Carolina University and conferred at length with their curators: Diane McKenzie and Elizabeth (Libby) Chenault at UNC, Sebrina Mabe and Russell Perkins at Wake Forest, and Ruth Moskop at East Carolina. They made preliminary selections of exhibit items, including 16th- and 17th-century illustrated books, ivory mannikins, broadsides and fugitive sheets with moveable flaps, a rare hand-colored copy of Vesalius's famous anatomy woodcuts, *De humani corporis fabrica*, a bronze flayed figure showing the underlying musculature, a surgical field manual, a renaissance amputation saw, a bas-relief skeleton carved from a single piece of ivory, and an African *mkisi mkondi*, or ritual healing figure. The exhibit now comprises more than 100 items spanning five centuries, from a late 14th-century Persian manuscript to mid-20th-century plaster sculpture; this article presents only a few.

One of the priceless early books from the Duke collection is *Ophthalmodouleia, that is, the service of the eyes* (Figure 1). This late-16th-century book, richly illustrated

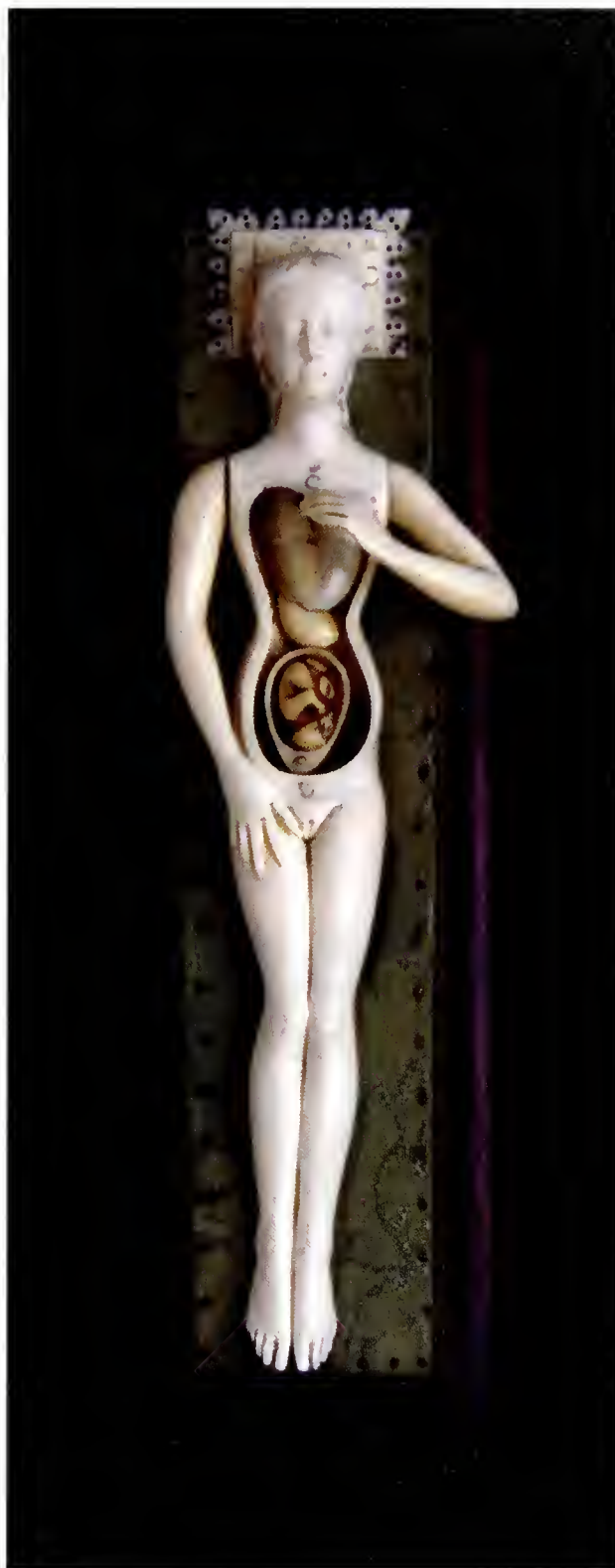


Figure 2. Ivory anatomical manikin. Western Europe, 17th-18th century. Trent Collection, History of Medicine Collections, Duke University Medical Center Library.

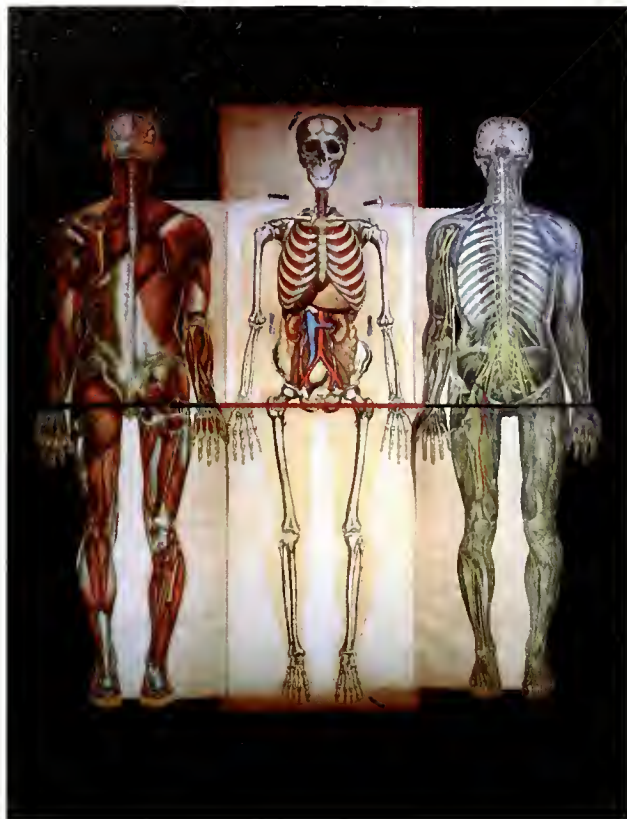


Figure 3. Anatomical manikin. Germany, ca. 1890-1910. Health Sciences Library, University of North Carolina at Chapel Hill.



Figure 4. Drum microscope. England, ca. 1850. Gift of Todd L. Savitt, PhD, History Collections, Health Sciences Library, East Carolina University.

with hand-colored woodcuts, is the first modern treatise on eye surgery and one of the first medical works to be printed in German instead of the traditional Latin or Greek. Its author, Georg Bartisch, is considered the founding father of modern ophthalmology, despite having received no formal medical education. Instead, he apprenticed himself to surgeons and oculists, so distinguishing himself that he was made court oculist to Duke Augustus I, Elector of Saxony in 1588. He produced this teaching text at his own expense, and probably contributed many of the 91 illustrations himself. These are portraits from life of men, women, and children, recording every detail of their Renaissance dress. The text includes chapters on magic and sorcery, as well as detailed descriptions of eye disorders and their treatment, with over 600 recipes for eye medications. The man in the picture shown is wearing an herb poultice for "white cataracts." This remarkable book is one of only three or four known copies of the hand-colored edition (one of the previously identified copies has been missing since World War II).

Ivory figurines such as that shown in Figure 2, from the Trent Collection at Duke, were commonly used by European physicians in the 17th and 18th centuries to demonstrate anatomy to barber-surgeons and midwives, who had little or no access to anatomy theaters. Removable chest- or abdomen-plates expose tiny abdominal and thoracic organs; models of women commonly reveal a uterus to which a separate fetus is connected by a fine red umbilical thread. Evidence indicates that these figurines were also used to educate patients—while preserving modesty and decorum—in the principles of reproduction and pregnancy, and to explain diagnoses and procedures. Many of them are highly elaborate, with fashionable coiffures and minutely detailed dresses. They lie in a pose of calm sleep on little wooden couches, their heads supported by lace-trimmed linen pillows.

Figure 3 shows a life-sized, full-color anatomical manikin, made in Germany around 1900, from the UNC Health Sciences Library. Precursors of the two-dimensional teaching models still in use, these manikins were first made in western Europe in the early 1800s. Most illustrated, front and back, at least two systems. This unusually elegant folding triple manikin displays the circulatory system when closed; the flap on one side shows the muscles and on the other shows the nervous system. Fully open, the center folio displays the skeleton with the major internal organs represented by superimposed movable flaps.

On loan from the medical library at East Carolina University, the early microscope shown in Figure 4 represents a type of small personal microscope first used by European researchers in the early 18th century and "the rage among upper-class salons" by the end of the century, when gentlemen diletantes pursued their own scientific "studies." This popular drum or compound microscope was manufactured in England around 1850 and modeled after Benjamin Martin's "Pocket Reflecting Microscope" first introduced into En-



Figure 5. Rainforth: The Stereoscopic Skin Clinic, 1910. Gift of Todd L. Savitt, PhD, History Collections, Health Sciences Library, East Carolina University.

gland in 1738. This popular design included a micrometer in the eyepiece, making possible accurate measurements. Initial versions of the instrument were made from pasteboard, ray skin, and wood; later ones were (like this one) all brass. They were often sold in a velvet-lined mahogany box with a range of accessories including lenses, specimen containers, guidelines for preparation of specimens, and even suggestions for study. An 1856 catalogue of instruments advertises similar microscopes at prices ranging from \$3.00 for "ordinary quality" to \$9.00 for the large deluxe model with multiple accessories.

This month's *Journal* cover shows an elegant hand-colored lithograph from the eight-volume *Traité complet de l'anatomie de l'homme* (1831-54), one of the most lavishly illustrated anatomical and surgical treatises ever published. This work is in the collection at Wake Forest University School of Medicine. It was compiled by a Parisian physician, Jean-Baptiste Marc Bourgery, with 726 illustrations by the artist Nicolas-Henri Jacob, a student of the brilliant neoclassical painter Jacques-Louis David. Using the new technique of color lithography and his own sophisticated artistic training, Jacob transformed drawings of dissections and anatomical preparations into strikingly beautiful images of both artistic and scientific merit. It is notable that he restores the flayed male figure to "life" with warm skin tones and soft

curly hair—an image more aesthetically appealing than had he rendered the cadaver's exterior as literally as its interior.

In the mid-19th century, New York City was a leading center of dermatologic research and practice. The Broome Street Infirmary for Diseases of the Skin, established in 1837, was the first institution for the care and teaching of skin diseases, and the New York Dermatological Society, established in 1869, was the first organization of its kind in the world. The 1879 publication of *Photographic illustrations of skin diseases* by George Henry Fox was a major dermatologic milestone, a pioneering attempt to illustrate skin disorders through photography. Valuable refinements on Fox's innovation were made possible by clinical application of the popular parlour stereoscope developed by Dr. Oliver Wendell Holmes. From the East Carolina University collection, Figure 5 above shows 25 pairs of selected images from a set of 132 stereoscopic photolithographs taken around 1910. Dr. Selden I. Rainforth, a private practitioner in New York, photographed his patients with a 5 x 7 inch camera equipped with two lenses, resulting in slightly different perspectives of the same image. When viewed through a stereoscopic viewer the paired photos produce three-dimensional images of skin diseases, greatly enhancing the precision of photography as a dermatologic teaching tool. On the back of each of the hand-colored slides in this set is a brief clinical treatise describing

the illustrated condition, giving the diagnosis, and prescribing appropriate treatment.

During the next two months the museum will display these and additional dozens of equally intriguing items. Thanks to the imagination, scholarship, and hard work of a small band of people in the state's medical schools, the North Carolina medical community and the general public have a unique opportunity to acquaint themselves with some often very beautiful, sometimes bizarre, and always fascinating objects and images, gathered in one place for the first time. Moreover, in the accompanying catalogue (available from DUMA in both hardbound and soft cover editions), Dr. Hansen and Ms. Porter have created a valuable and richly illustrated work of scholarship. The *Journal* heartily recommends that readers take advantage of this opportunity to enjoy—and learn from—the exhibit.

Acknowledgements. The author is most grateful to Suzanne Porter for providing information, illustrations, and good counsel in the preparation of this article, and to both her and Dr. Albert Heyman for reviewing the manuscript. □

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SESSION OF THE HOUSE OF DELEGATES

will convene at the
Sheraton Imperial Hotel, Research Triangle Park, North Carolina, at the following times:

Friday, November 12, 1999 - 9:00 am - opening session

Sunday, November 14, 1999 - 9:00 am - second session

A member of the Credentials Committee will be present at the Meeting Registration Desk on Thursday, November 11, 1999, from 3-5 pm, and Friday, November 12, 1999, from 8-9 am, to certify Delegates. Delegates must bring their Credential Cards for presentation at the Registration Desk. Delegates must wear their badges to be seated in the House of Delegates.

REFERENCE COMMITTEE HEARINGS

Reference Committee hearings are scheduled to begin:

Friday, November 12, 1999 - 1:30 pm

Carl K. Rust, II, MD, President
Don C. Chaplin, MD, President-Elect
Charles F. Willson, MD, Secretary-Treasurer
P. William Aycock, Jr., MD, First Vice-President
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A 47-Year-Old Woman with Crohn's Disease Who Bled and Bled and Bled

Section on Gastroenterology

Wake Forest University School of Medicine

SERIES MODERATOR: Walter Roufail, MD, Clinical Professor of Medicine

PRESENTER: Malay Dey, MD, Gastroenterology Fellow

DISCUSSANT: Benoit C. Pineau, MD, FRCP(c), Assistant Professor of Medicine

DR. DEY:

A 47-year-old woman with diabetes mellitus, hypertension, and mild chronic renal insufficiency was transferred from another hospital because of recurrent episodes of passing bright red blood, clots and maroon-colored stool via her chronic ileostomy. She had required multiple blood transfusions.

Seven years before, intestinal bleeding had led to right hemicolectomy with ileo-transverse colon anastomosis. The resected colon was thin and atrophic and showed mild chronic inflammation and pseudopolyps suggestive of "burned-out" chronic ulcerative colitis. Two years later, recurrent bleeding culminated in a total colectomy and permanent ileostomy; pathological examination revealed Crohn's colitis. She was begun and maintained on corticosteroids and 6-mercaptopurine (6-MP).

Around the time of colectomy, serum enzyme analysis showed an elevated alkaline phosphatase (295 U/L) and gamma-glutamyl transferase (1764 U/L). Viral hepatitis and anti-mitochondrial antibody tests were negative. Endoscopic retrograde cholangio-pancreatography (ERCP) showed a normal common bile duct but the intrahepatic ducts could not be visualized. A computerized tomogram (CT) of the abdomen showed a slightly nodular liver contour with scattered punctate lesions; liver biopsy showed granulomatous hepatitis. In the past she had drunk significant amounts of alcohol, but none for years.

She was hospitalized elsewhere for treatment of a febrile pneumonia. She began passing blood from her ileostomy, requiring multiple blood transfusions. An esophago-gastro-duodenoscopy (EGD) showed only Candida esophagitis. On ileoscopy there was neo-vascularization of the terminal ileum suggesting Crohn's disease. Because of the pneumonia and esophagitis (and a significant thrombocytopenia), 6-MP was discontinued. She was maintained on prednisone and given a sustained-release mesalamine preparation. A bone marrow biopsy was mildly hypocellular, suggesting bone marrow suppression. Further bleeding from the ileostomy and a decrease in blood hemoglobin to 8.1 g/dL prompted transfusion and transfer to the Wake Forest University-Baptist Medical Center.

On physical examination her vital signs were stable. The abdominal examination was normal, and the ileostomy appeared healthy, but there was a small amount of blood and black stool in the bag. The white blood cell count was 38.6, hemoglobin 12.7, platelets 65, and the prothrombin time was 15

seconds. Serum creatinine was 2.1 mg/dL with normal electrolytes. There was slight elevation of the serum aspartate aminotransferase (AST) at 55 U/L and alkaline phosphatase at 157 U/L, decrease in serum albumin (1.7 g/dL), and normal levels of serum alanine aminotransferase (ALT) and total bilirubin.

Table 1. Normal values for laboratory findings listed for this patient.

| | |
|------------------|-----------------|
| Albumin | 3.2 - 5 g/dL |
| Total bilirubin | 0.1 - 0.2 mg/dL |
| Direct bilirubin | 0.0 - 0.4 mg/dL |
| Alk phosphatase | 30 - 110 U/L |
| SGOT (AST) | 5 - 35 U/L |
| SGPT (ALT) | 0 - 36 U/L |
| GGT | 5 - 55 U/L |
| WBC | 4.8 - 10.8/1000 |
| HgB | 12 - 16 g/dL |
| Platelets | 160 - 360/1000 |
| PT | 10.8 - 13.9 SEC |
| PTT | <31 SEC |
| Creatinine | 0.5 - 1.5 mg/dL |

DR. PINEAU: This patient with Crohn's disease had undergone colectomy and ileostomy. Now she has severe gastro-intestinal (GI) bleeding. Massive GI bleeding is uncommon but occurs in 1-2% of patients with Crohn's disease, usually from sites in the colon. In our patient, potential causes of bleeding specific to inflammatory bowel disease include a Crohn's ulcer, varices associated with portal hypertension, and intestinal or biliary malignancies. The differential diagnosis also includes other common (gastric or duodenal ulcers, erosive gastritis, vascular malformations) and less common causes of GI bleeding (Mallory-Weiss tear, Meckel's diverticulum, Dieulafoy's lesion, small bowel diverticulosis, aorto-enteric fistula, and hemobilia).

DR. DEY: EGD revealed a few esophageal erosions as well as a Dieulafoy's lesion (with stigmata of recent bleeding) on the lesser curvature of the stomach. The lesion was injected with epinephrine and cauterized. She continued to bleed from the ileostomy and required 6 units of blood. Another EGD again showed a few esophageal erosions and the Dieulafoy's lesion with a visible blood vessel. It was again cauterized with apparent success. Ileoscopy revealed a normal mucosa, but old blood clots were encountered at a distance of 25cm from the ostomy. A small bowel enteroclysis a few days later showed pelvic adhesions but no cause for bleeding. The patient was discharged in stable condition.

DR. PINEAU: The clinical presentation in this case is somewhat atypical for patients with Dieulafoy's lesions because there was no hematemesis and no blood was seen in the stomach, even though there were clots in the ileum at ileoscopy. Nevertheless, upper endoscopy identified a Dieulafoy's lesion as a potential source of bleeding. This vascular abnormality represents a submucosal ectatic end-artery that remains as large as its feeding artery. It is believed that focal pressure from these large caliber vessels thins the overlying mucosa, leading to erosion of the exposed vessel and hemorrhage. The usual lack of mucosal ulceration makes detection more difficult, but with new endoscopic technology it is increasingly being recognized. The usual site of bleeding lies 6 cm distal to the cardioesophageal junction, where the arteries are largest. Several endoscopic techniques can control bleeding, including injection and thermal therapy as well as the use of hemoclips.

The Liver and Inflammatory Bowel Disease Several kinds of liver disease are associated with inflammatory bowel disease (IBD). The most commonly is primary sclerosing cholangitis (PSC), but fatty infiltration of the liver (steatosis) occurs in 4-6% of patients with IBD, and granulomatous hepatitis and amyloidosis each in 1% or less of patients with Crohn's disease. Autoimmune hepatitis, micronodular cirrhosis, and alcoholic liver disease always need to be considered.

Primary Sclerosing Cholangitis PSC is a chronic, cholestatic liver disease in which progressive fibrosis and inflammation of the extra- and intra-hepatic bile ducts lead to cirrhosis. It predisposes to the development of cholangiocarcinoma. In our patient, several factors point away from the diagnosis of PSC. First, although approximately 70% of patients with PSC have IBD, it is primarily associated with ulcerative colitis rather than Crohn's disease. (85% have ulcerative colitis; 10%, Crohn's disease; and 5%, indeterminate colitis). Second, PSC is twice as common in men as in women. Finally, cholangiography did not reveal the typical strictured and beaded appearance of the biliary tree. ERCP is usually diagnostic and is essential for the diagnosis, but the cholangiogram obtained in this patient was

inadequate because the intrahepatic ducts were not visualized. She needed selective deep biliary cannulation and maybe the use of balloon occlusion cholangiography.

Granulomatous Hepatitis

In the patient under discussion, chronic liver disease was due to the granulomatous hepatitis seen on previous liver biopsy. CT scan revealed presence of suspected granulomas, but this condition cannot usually be diagnosed radiographically. Granulomatous hepatitis is more common in Crohn's disease than ulcerative colitis. In general, the non-caseating granulomas are histologically similar to those found in affected intestinal wall. Reversible hepatic granulomatosis has also rarely been reported with the use of sulfasalazine. Other contributing factors may include steatosis associated with this chronic inflammatory condition, malnutrition, or steroid therapy. Of course, chronic alcoholic liver injury could also be a contributing cause.

DR. DEY:

One week after discharge, she came back to the ER with confusion. The blood ammonia level was normal but she had a blood sugar of only 40 mg/dL. The confusion cleared when the blood sugar was normalized, but she began to bleed again from the ileostomy. EGD showed no blood in the stomach or duodenum, but there were four gastric ulcers, none of which appeared to have bled. Biopsies were positive for Helicobacter pylori, and eradication therapy was administered. Two days later, another episode of bleeding required 2 units of blood. A mesenteric arteriogram with selective celiac and superior mesenteric artery injections revealed no source of bleeding. Enteroscopy with a dedicated push enteroscope showed normal mucosa to the level of the distal jejunum.

DR. PINEAU:

The source of GI bleeding is considered obscure in about 5% of cases. Overt blood loss (with evidence of gross bleeding such as melena, maroon stools, or hematochezia) is distinguished from occult bleeding (presenting as iron deficiency anemia or guaiac-positive stools). Patients with persistent bleeding have usually been thoroughly evaluated with EGD, colonoscopy, and small bowel radiographic studies (often done repeatedly) before enteroscopy is considered. Bleeding is defined as being of obscure etiology when no cause can be identified with these diagnostic evaluations. Subsequent diagnostic evaluations become increasingly complex, expensive, and risky. They include tagged RBC scan, Meckel's scan, and intra-operative enteroscopy.

In the present case, the patient had undergone four upper endoscopies, two ileoscopies, an enteroclysis, and a mesenteric arteriogram before small bowel push enteroscopy was considered. Some patients with obscure GI bleeding undergo up to ten such diagnostic evaluations before enteroscopy is performed. Enteroclysis identifies the cause of bleeding in approximately 10% of cases and angiography in about 17%, the yield being higher when there is active bleeding. Both of these investigations were negative in our patient. Push enteroscopy has a diagnostic yield of approximately 30-35% in this situation; approximately two-thirds of the identified lesions are vascular malformations, 15% are small bowel tumors, and the remaining 20% represent miscellaneous lesions. It, too, was negative in our patient.

DR. DEY:

Non-enhanced and enhanced CT scan of the abdomen and pelvis, done to rule out intra-abdominal varices, revealed a slightly nodular liver with scattered punctate lesions compatible with old granulomatous. The spleen was mildly enlarged and there was significant ascites but no varices were seen. The findings suggested decompensated cirrhosis (Figure 1). The patient was sent home to return immediately for a tagged RBC scan in case of active bleeding.

Two weeks later she again bled, became hypotensive and required 4 units of blood. A radioactive technetium-tagged RBC nuclear scan revealed no active point of bleeding. The clinical suspicion was that she had ectopic varices including peristomal varices; therefore, direct trans-hepatic portal venography was performed. The portal-systemic gradient was high at 15 mmHg (normal 5-6). The clinical suspicion was confirmed by direct superior mesenteric venography, which showed retrograde flow to peristomal varices with shunting into the left iliac vein (Figure 2). The peristomal varices were embolized with stainless steel coils following which a transjugular intrahepatic portal systemic shunt was placed through the hepatic parenchyma. ERCP showed no changes suggestive of PSC. Transjugular liver



Fig 1. Computed tomographic scan of the liver. The liver has punctate granulomas (open arrow) and a slightly irregular liver contour surrounded by significant ascites (solid arrow). The findings are consistent with decompensated cirrhosis.

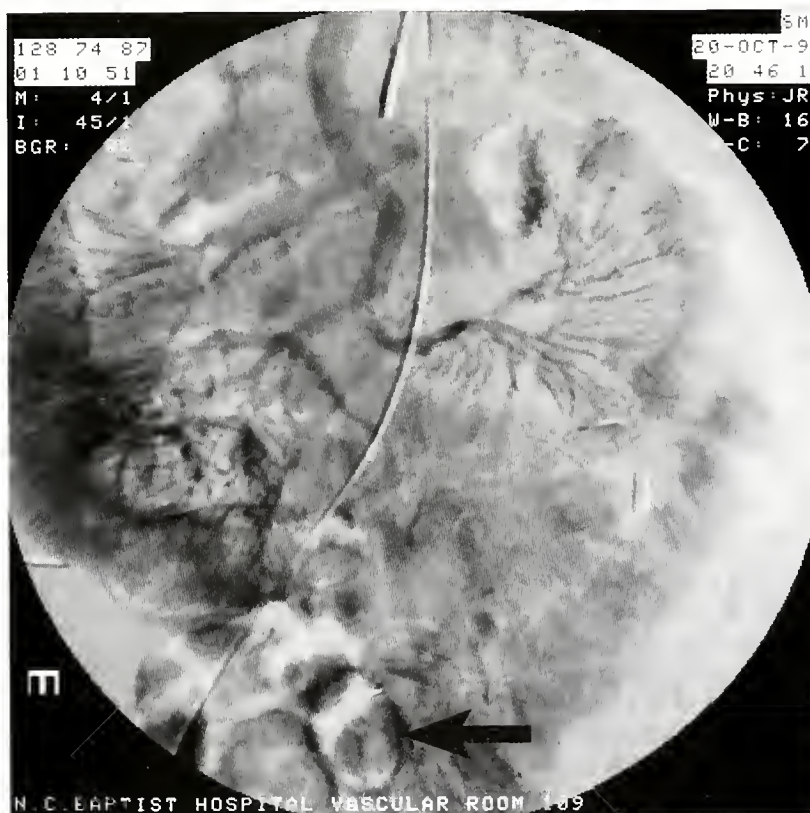


Figure 2. Selective transhepatic superior mesenteric venography showing retrograde flow filling peristomal varices (arrow).

Table 2. Location of varices.

| Cause of portal hypertension | Location of varices |
|-------------------------------------|----------------------------|
| cirrhosis of the liver | esophageal, gastric |
| portal vein thrombosis | duodenal, biliary, gastric |
| schistosomiasis | gastric |
| hepatocellular or metastatic cancer | gastric, duodenal |
| cirrhosis with ostomy | stoma |

biopsy showed cirrhosis and slight steatosis. Following the shunting, she has remained clinically stable with no further episodes of bleeding.

The final clinical diagnoses were: Obscure GI bleeding caused by peristomal varices and decompensated cirrhosis with portal hypertension due to granulomatous hepatitis and steatosis.

DR. PINEAU: The esophagus is the most common site of variceal bleeding; extraesophageal (ectopic) varices bleed less commonly but still account for up to 30% of all variceal bleeding. They are particularly difficult to diagnose and manage. Table 2 summarizes the typical location of varices depending on the etiology of portal hypertension.

Ectopic Varices Extraesophageal varices should be considered in all patients with portal hypertension and GI bleeding in whom endoscopy shows no bleeding esophageal varices. Other diagnostic clues include an extrahepatic cause of portal hypertension, a history of GI surgery with ostomy placement accompanied by cirrhosis, and massive bleeding without hematemesis. The patient's history and a high degree of suspicion will increase the likelihood of correct diagnosis.

Treatment of variceal hemorrhage Optimal treatment depends on the location of the varices. Intravenous octreotide is given for 48 hours to all portal hypertensive patients with significant GI bleeding. Endoscopic ligation is the first line of therapy for bleeding esophageal varices, followed by sclerotherapy. If these modalities do not solve the problem, transjugular intrahepatic portal systemic shunt (TIPS) should be considered. For gastric varices, sclerotherapy, banding, and detachable snare have been used with variable success, but the prognosis is poor and so several authors recommend TIPS as the treatment of choice for gastric varices. Duodenal varices are rare, but endoscopic banding, sclerotherapy, mesocaval shunt, and TIPS have all been tried with some success. Jejunal and ileal varices usually cannot be treated endoscopically, making early surgical therapy (shunting, resection of affected bowel, or variceal ligation) the treatment of choice. Solitary colonic varices are usually treated with either sclerotherapy or banding; multiple colonic varices may require TIPS or surgical portal decompression. Recurrent hemorrhage from colon varices may warrant colectomy. Rectal varices may respond to endoscopic sclerotherapy or ligation; intractable bleeding, while rare, has been treated with inferior mesenteric vein ligation and with TIPS.

Peristomal varices Peristomal varices are most commonly seen in patients who, after a colectomy for ulcerative colitis, develop portal hypertension from sclerosing cholangitis. They are also seen in cirrhotic or portal hypertensive patients who have a colostomy or ileostomy and in patients who have ileal conduits placed after resection of bladder or rectal carcinoma. Peristomal varices arise from venous anastomoses between a high-pressure portal system and the low-pressure venous network of the abdominal wall or inferior vena cava. The time required for development of peristomal varices and hemorrhage is not clear, but the average time is 28 months for colostomies and 48 months for ileostomies (range: 1.5 to 348 months). Treatment options include local compression, sclerotherapy, surgical ligation, and stoma relocation. However, the transjugular porto-systemic shunt (TIPS) with or without transcatheter embolization (as in the present case) is the treatment of choice for peristomal varices. □

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Should Doctors Give Hormones to Healthy Elders?

Kandaswamy Jayaraj, MD

The physiological changes of aging resemble some endocrine deficiency states. For example, fatigue, lethargy, cold intolerance, constipation, depression, and skin changes, which are common in the elderly, mimic the symptoms of hypothyroidism. In fact, hormone levels normally do change with aging, leading some to suggest that hormone replacement might prevent or even reverse age-related changes. In addition, patients often raise questions about whether hormone replacement will keep them youthful and healthy. In this article I review the available evidence pertaining to growth hormone (GH), testosterone, estrogen, dehydroepiandrosterone (DHEA), melatonin, and thyroxine in the maintenance of health, function and vigor in later life. Estrogen replacement therapy, which is of established benefit in postmenopausal women, is not reviewed in detail.

As humans age, there is atrophy, fibrosis, and cystic degeneration of many endocrine glands. The resulting changes in hormonal secretions may decrease the frequency and amplitude of the daily rhythms of hormonal release, or even lower serum hormone levels.¹ Mean serum levels of growth hormone, testosterone, dehydroepiandrosterone (DHEA), and melatonin all become lower with aging. There are known and potential health consequences associated with these changes. I will discuss the hormones in turn.

Growth Hormone

Serum levels of GH decrease in a stepwise fashion with aging. Every decade after age thirty brings a decrease of approximately 10% in mean GH concentration² so that levels in the elderly are less than half those of a young adult.

Dr. Jayaraj is doing a combined fellowship in the Division of Endocrinology, Metabolism, and Nutrition and the Division of Geriatrics at Duke University Medical Center, Box 3021 DUMC, Durham 27710.

Pituitary changes (fibrosis, focal necrosis, deposition of iron and focal adenoma formation) correspond to the decreasing GH levels and lead to a 20% reduction in the size of the pituitary in the elderly.³

Aging is associated with loss of muscle mass as well as decreased GH levels and has led to speculation that GH replacement might reverse some of the changes of aging. To test this idea, Rudman et al⁴ gave GH (0.03mg/kg of body weight three times a week) for 6 months to 12 men aged 61 to 81 years. The subjects had no evidence of GH deficiency, but treatment raised GH levels to those found in young adults and produced a 9% increase in lean body mass, a 14% decrease in fat mass, and a 2% increase in vertebral bone density. There also was a rise in mean fasting blood glucose and blood pressure.

Rudman et al studied their subjects for only a short period and made no measurement of functional outcome. Papadikas et al⁵ addressed those shortcomings by measuring strength of knee flexor and extensor muscles, and handgrip. Physical performance was assessed by measuring ability to lift a heavy book, remove a jacket, climb stairs, pick up a coin from the floor, and walk a 50-foot test course. These authors confirmed the effect of GH on bodily composition observed by Rudman et al, but found no improvement in functional, physical or cognitive performance. Furthermore, 65% of subjects developed ankle edema, 54% joint pains, 38% hand stiffness, 20% malaise, and 8% tender breast enlargement.

Taffe and colleagues⁶ studied the effects of exercise training with and without GH treatment. Exercise increased strength and physical performance, but GH added nothing. The authors concluded that the increased lean body and muscle mass induced by GH did not mean an increase in the contractile proteins necessary for improved muscle function and strength.

Overall, we can say that there is no support for the idea that GH replacement can reverse age-related loss of muscle function. A forthcoming report of a multicenter, NIH-sponsored trial may add further information, but for now we must

conclude that GH can produce anatomical changes but no functional improvement in older men. Treatment runs the risk of inducing significant side effects, and cannot currently be recommended for the otherwise healthy elderly.

Growth Hormone Secretagogues

Growth hormone releasing peptides (GHRP), first discovered in 1976,⁷ cause the pituitary to release GH.^{8,9} Other, non-peptide secretagogues such as spiropiperidene and hexarelin also release GH.¹⁰ Under normal conditions, GH is released in periodic pulses and secretagogues increase the amplitude of those normal pulses. Augmenting the pulsatile release of GH could be an advantage because serum levels would be more physiological and might produce fewer side effects.¹¹ Secretagogues can be administered by mouth and are less expensive than synthetic GH, but these drugs are still under investigation and not yet approved for use.

Many firms in the US sell dietary supplements (essentially mixtures of amino acids such as lysine and arginine) labeled as "*pro-growth hormone*." These materials produce sales of millions of dollars per year. Unfortunately, these "dietary supplements" have no proven scientific effects, and there is no scientific basis for using them. Genuine GH (a peptide which is digested in the gastrointestinal tract) cannot be taken by mouth.

Testosterone

Testosterone is secreted by testicular leydig cells under the control of the pituitary (through the secretion of luteinizing hormone or LH). Testosterone circulates largely bound to testosterone binding globulin, but the free, not the globulin-bound, fraction represents the hormone active on target tissues.¹²

Since testosterone secretion is pulsatile, detection of age-related changes requires that levels be measured at a standardized time of day.¹³ After much debate and confusion caused by use of insensitive assays,¹⁴ it is now generally accepted that total serum testosterone levels do not change, but free testosterone levels decline with aging.¹⁵ Up to 50% of older men have abnormally low levels of free testosterone.¹⁶ Furthermore, the metabolism of testosterone is reduced with age, and tissue resistance to testosterone action develops.^{17,18} The decline in testicle function is gradual and there is no clear male equivalent of the menopause (the "andropause"). Most men have no symptoms until late in life and one third of men never develop symptoms.

Does testosterone replacement undo the changes of aging? If so, when and who should be replaced? Testosterone acts on muscle, bone, penis, and brain. Could replacement decrease the incidence of osteoporosis? increase muscle

mass and strength? correct impotence? or improve cognition? There is evidence that testosterone treatment increases muscle mass and strength, increases bone mass, induces some changes in sexual behavior and memory function, and consistently produces a feeling of generalized well-being. But bear in mind that the studies are small and uncontrolled (in a discipline notorious for producing placebo effects), have only short-term follow-up, lack uniformity in patient selection or treatment regimens, use a variety of laboratory assays for testosterone measurement, and provide no long-term data on functional status, mortality or morbidity.

Tenover gave testosterone injections daily for three months to older men with a mean total testosterone level of 13.9 ng/l (normal for young adults = 12.1-34.7ng/l). Treatment increased lean body mass by 6% and hematocrit by 7%, decreased fat mass by 4%, total cholesterol by 10%, and low-density lipoprotein cholesterol by 12%.¹⁹ Morley gave bi-weekly intramuscular injections of testosterone to elderly, hypogonadal men (mean age 77 years) and found an increase in hand grip strength.²⁰ Urban²¹ gave testosterone injections for 4 weeks to 6 men with normal testosterone levels. Subjects increased their muscle strength, protein synthesis and serum insulin-like growth factor (IGF-1) to levels found in young persons.

All together, fewer than 150 men have been studied in the various trials of testosterone replacement on muscle mass.^{19,22} Most studies show an increase in lean body mass, in muscle mass and handgrip or lower extremity strength, and a decrease in fat mass. However, we need larger and better controlled studies to see if the effects are sustained and lead to improved function and decreased mortality.

Since 1948 some ten studies, varying from 6 weeks to 18 months in duration, have looked at the effect of testosterone treatment on bone mass in about 100 men.^{19,20,23,24} Short-duration studies show changes in blood osteocalcin and alkaline phosphatase levels compatible with bone formation, or changes in urinary calcium, hydroxyproline or pyridinoline excretion consistent with decreased bone turnover; long-term studies indicate increased bone mass by densitometry. No published studies assess the effect of testosterone on fracture rates.

Sexual function (potency, libido or orgasmic frequency) has not been studied well.^{19,21} Some studies do report improved sense of well being, or an increase in libido (or both) after testosterone supplementation. Less than 5% of subjects report improved potency or erectile function. There is very scanty information about how testosterone affects cognition except for some improvement in spatial recognition.^{19,22}

Testosterone preparations. Each of the three commercially available preparations of testosterone has advantages, disadvantages, and side effects. Oral (halogenated) testosterone derivatives, though available, are currently not used in men because of their potential hepatotoxicity. Parenteral

(intramuscular) testosterone, available in short-acting, long-acting, and depot forms, is the most widely used (all the studies reviewed in this paper used intramuscular testosterone). Irregular absorption of injected testosterone (high levels for a few days after injection and low levels before the next dose) can cause mood swings. Transdermally released testosterone is relatively new, and formulated as scrotally- and non-scrotally-worn patches to be applied to a skin area that may need to be shaved. The scrotal patch is more efficacious because scrotal tissue contains 5-alpha reductase, an enzyme that converts testosterone to dihydrotestosterone (DHT), the active form of testosterone. Up to 40% of patch users develop pruritis or blister formation.

Side effects of testosterone are derived from short-term (<12 months) studies. Hepatotoxicity has not been a major side effect but liver function should be monitored regularly. Unwanted effects include (1) the potentiation of coronary artery disease, which may be due to lipid abnormalities although four studies show unchanged or improved cholesterol levels and only one recorded a decrease in high density lipoprotein cholesterol; androgens may increase coronary artery disease by other mechanisms than lipids; (2) acceleration of benign or malignant prostate disease, possible but not yet studied well; androgen supplementation does not induce major changes in blood levels of prostate-specific antigen (PSA), or symptomatic or functional prostatic obstruction; (3) water retention, which can exacerbate hypertension, heart failure and coronary heart disease; (4) polycythemia and increased blood viscosity, which may precipitate or exacerbate preexisting cardiac or cerebrovascular disease; (5) exacerbation of sleep disorders; and (6) gynecomastia.

In summary, testosterone replacement has beneficial effects in elderly hypogonadal men (those with documented low morning levels of free testosterone) but must be given with adequate monitoring. It increases muscle mass and strength, bone formation, and may enhance sexual behavior, sense of well-being and memory. Increased red cell production may improve the anemia often seen in the elderly. Testosterone-replaced patients should know about and be monitored for side effects of exacerbated hypertension, heart failure and angina. Prostate size, PSA, liver function tests, and blood counts need to be monitored. There is too little evidence to support giving testosterone to older men with normal testosterone levels who complain of decreased libido, fatigue or weakness.

Estrogen

Estrogen replacement given to perimenopausal women can prevent both immediate symptoms (hot flashes and atrophic vaginitis) and long-term complications (osteoporosis and, possibly, cardiovascular disease) of estrogen deficiency. Estrogen replacement is not indicated for healthy elderly

women, well out of menopause, who have a normal bone mass and lipid profile. It does appear helpful in women with symptomatic osteoporosis, but the use of estrogen for secondary prevention in menopausal women with coronary disease is problematical. Available studies do not show a clear advantage, despite an improved lipid profile. The pros and cons of estrogen replacement should be discussed with all elderly women. It is definitely beneficial for bone and may have a beneficial effect on the heart after women have taken it for more than 2 years. Estrogen replacement should be accompanied by progesterone and regular pap smears in all women with a uterus. All treated women need yearly mammograms.

Melatonin

The pineal gland, which is situated behind the third ventricle, had been considered a vestigial organ for three centuries. In 1959 it was discovered to secrete melatonin.²⁵ Since then, roles have been proposed for melatonin in control of sleep and circadian rhythm, immunomodulation, cancer protection, scavenging of free radicals, and (possibly) protection against aging.

The pineal gland consists of two types of cells: the predominant pinealocytes, which produce melatonin, and supportive neuroglial cells. Pinealocytes convert tryptophane to 5-hydroxytryptophane, which is decarboxylated to form serotonin (5-hydroxytryptamine), and serotonin in turn is converted into melatonin (5-methoxy-N-acetyltryptamine). Serotonin has been suggested as a pro-aging hormone and melatonin as an anti-aging hormone.

Melatonin is released under the influence of endogenous norepinephrine. In darkness, retinal photoreceptors signal the hypothalamus to increase norepinephrine levels and thus increase melatonin synthesis. This activity declines at sunrise. Secreted melatonin diffuses into the blood stream, and so blood levels of melatonin increase at night. In humans melatonin levels rise soon after darkness, peak in the middle of night, and gradually fall as dawn approaches. Exposure to ordinary fluorescent light can cause a brisk inhibition of melatonin secretion.²⁶

The pineal gland contains a genetically predetermined number of pinealocytes; with aging the numbers decrease and there is a corresponding decrease in melatonin secretion, but the decreased sympathetic activity found with aging may also contribute. Calcification of the pineal gland proceeds throughout life, reducing its size and function.

The anti-aging, free-radical-scavenging, and anti-oxidant effects of melatonin have been evaluated only in animals. Circadian rhythm effects, and relation to hypnosis have been evaluated only in humans. Anti-cancer effects, immune-regulation, sexual maturation, and reproduction effects have been studied in both animals and humans.

Anti-aging effects. The ability of melatonin to prolong life has been studied in mice and rats; human studies are not feasible. In 1959, Malm et al²⁷ showed that pinealectomy shortens the life span of rats. Dilman et al²⁸ later showed that daily injection of a pineal polypeptide extract increases the life span of rats by 10-25%. Pierpaoli et al²⁹ found that adding melatonin to the drinking water of male mice at night lengthened their life span to an average of 931 days compared to 752 days in controls. Ablation of the pineal gland produced pathological changes in mice similar to those found in aging, but evening administration of melatonin corrected the changes.²⁹ Aging was inhibited and lifespan prolonged by grafting pineal glands of young mice into older animals.³⁰ Still, there are no human studies suggesting that melatonin can increase lifespan or prevent aging.

Anticancer effects. Melatonin, used as an adjuvant treatment, slowed the progression of breast cancer in estrogen-receptor positive patients.³¹ Similar effects have been noted in the treatment of glioblastoma and melanoma.³² Plasma melatonin levels are low in patients with colorectal, breast, and prostate cancer. Melatonin administration reduced tumor growth by 27% in a British study of patients with various advanced metastatic solid tumors; half of the treated patients were alive after 1 year compared to 15% of controls.³³ These studies imply a protective role for melatonin in cancer occurrence and treatment.

Hypnotic and circadian rhythm effects. Melatonin affects the speed of falling asleep, and the duration and quality of sleep. All studied doses (0.1, 0.3, 1.0 and 5.0 mg) produce similar hypnotic effects. Recent studies show that melatonin can alleviate symptoms of jet lag.³⁴ The significance of the different doses recommended for sleep (0.3mg 2 hrs before bed) and for jetlag (5mg the evening on arrival and for 3 more days) is unclear, but commercial melatonin often contains impurities (one study found that six of ten commercial preparations had impurities).³⁴

In summary, animal studies show melatonin to have antioxidant, immunomodulant, and anti-aging properties, but it is hard to extrapolate these limited observations to humans. Human studies do show that melatonin has anticancer activity and a possible adjuvant role in treatment of metastatic cancer. Circadian rhythm and hypnotic effects are based on small-scale human studies. The FDA has not approved melatonin as a therapy. Over-the-counter preparations are not subject to FDA regulations and have impurities in them.

DHEA

Dehydroepiandrosterone (DHEA) and its sulfated ester, DHEA-S, are androgenic hormones synthesized from cholesterol in the adrenal cortex and, to a small extent, in the

gonads. DHEA-S is a reservoir form and DHEA is the active hormone; each can be converted into the other by all tissues. The function of these hormones in humans is unknown, but in animals DHEA appears to bolster immune protection against viral infections and augment autoantibody formation. Other animal data suggest that DHEA protects against coronary artery disease, breast cancer, and obesity, perhaps through inhibition of glucose-6-phosphate-dehydrogenase, an enzyme involved in carcinogenesis, lipogenesis, and production of toxic free radicals.

DHEA can be considered a multifunctional steroid hormone of unknown importance in humans. Serum levels of DHEA peak during the second decade of life and decline by about 10% during every decade thereafter.³⁵ This age-related decline has been proposed to cause the decreased muscle and bone mass, impaired cognition, and increased atherosclerosis associated with aging. Epidemiological data in humans suggest an inverse correlation between DHEA-S levels and breast cancer, immunocompetence and cardiovascular risk.³⁶

The role of DHEA has been studied in humans. Nestler³⁷ gave healthy young men 1600 mg/day of DHEA by mouth for 4 weeks. There was a decrease in blood levels of total and low density lipoprotein cholesterol, a 31% decrease in body fat, and an imputed increase in muscle mass. The dose used was supraphysiological, but there were no reported side effects. Unfortunately, Usiskin³⁸ could not reproduce Nestler's results in obese patients, and Welle³⁹ found no effect on body mass in healthy non-obese young men.

In a double-blind, crossover trial, Morales and Yen⁴⁰ gave 50mg of DHEA or placebo by mouth for 6 months to 13 healthy men and 17 women aged 40-70 years. Within 2 weeks, serum concentrations of DHEA and DHEA-S reached levels found in young adults. In subjects on DHEA, blood levels of testosterone and its potent derivative, DHT, doubled, and IGF-1 levels were 50% higher than with placebo. Both men and women noted an increased sense of well-being during DHEA treatment, but there was no change in libido, and no discernible effect on fat mass, muscle mass or lipoprotein panel.

Yen⁴¹ et al conducted a double-blind, controlled trial of dose and duration of DHEA in 16 patients aged 50-65 years. A dose of 100 mg/day increased DHEA levels to those of young adults, and produced a two- to three-fold increase in the serum levels testosterone and DHT. IGF levels and lean body mass, knee flexion and extension strength all increased. Body fat decreased significantly. There was no change in bone mineral density or blood lipid or glucose levels. There were androgenic side effects such as increased facial hair in women, but not in men.

In summary, currently available data on giving DHEA to the elderly is derived from small studies with short follow-up. Beneficial effects were minimal, and there were no side effects in men taking up to 100 mg/day, but some women noted hypertrichosis. In theory, DHEA can cause hepatotoxicity and might stimulate growth of both prostate and breast

Table. Recommendations on hormonal replacement in the elderly.

| Hormone | Effectiveness | Recommendations |
|---------------------|---------------|--|
| Growth Hormone (GH) | Questionable | Not recommended |
| GH Secretagogues | Experimental | Not recommended |
| Testosterone | Fair/Good | Recommended if levels are low; needs regular monitoring. |
| Estrogen | Fair/Good | Recommended in selected patients; needs regular monitoring. |
| Melatonin | Fair* | Optional (no side effect) |
| DHEA | Fair* | Optional (no side effect) |
| Thyroxine | Deleterious | Not recommended |

*Good data in animal studies

cancer, but no studies address these potential problems. Muscle mass and strength and IGF levels appear to increase. Because there are no data on long-term efficacy or side effects, DHEA replacement should be considered optional for healthy older adults who have reviewed the available facts. The FDA has not approved DHEA, but it is available over the counter as a food supplement.

Thyroid Hormone

Many elderly people have symptoms suggestive of hypothyroidism even though their blood levels of thyroid hormones are normal. This has led to speculation that subtle thyroid hormone deficiency plays a role in aging and that thyroxine replacement might prevent or even reverse changes of aging.

Thyroid fibrosis and nodule formation increase with aging.⁴² One study estimated that up to 90% of women over 70 years of age have thyroid nodules.⁴³ Age-related changes in thyroid function include an attenuation of the increase in basal metabolic rate induced by thyroid hormone, a decrease in the frequency and duration of pulsatile release of thyroid stimulating hormone (TSH) from the pituitary, a decrease in TSH response to thyrotropin releasing hormone (TRH), and reduced blood levels of free thyroxine (FT4) without a change in total T4 concentration. These changes resemble those seen in mild hypothyroidism, but there is no documented evidence that they reach the magnitude seen with documented hypothyroidism.

There is thought to be an age-related defect in the sensitivity of thyroid hormone receptors. Overall, it seems clear that aging leads to resistance to at least some aspects of thyroid hormone action. The changes of aging differ from the classic findings of hypothyroidism (elevated TSH, low T4, and exaggerated TRH response), but this may be due to age-related changes in hypothalamic control of pituitary TSH

secretion. Understanding the effect of aging on thyroid hormone action (and vice versa) is still in most primitive stages.

No available studies suggest a lessening of mortality or morbidity, or an improved quality of life when thyroxine is given to elderly persons with normal FT4 and TSH levels. Treatment should be based on finding abnormal hormone levels, not on symptoms alone.

Conclusions

We are just beginning to unravel the potential of hormone supplementation to lessen the impact of aging. In general, available hormones can be divided into three groups (Table): those of questionable effectiveness but without major side effects, those that are effective but have harmful side effects, and those that are ineffective. Melatonin and DHEA are of questionable effectiveness but have no major side effects; growth hormone, testosterone and estrogen are effective but have serious side effects; thyroxine is ineffective. We need large-scale, long-term studies before we can recommend routine prescription of any them. Pressure from the media and increasing public awareness of the fragmentary data implying that these hormones are useful means that physicians will be asked by patients to prescribe these hormones. The best we can now do is present the available data and let the individual decide. Some hormones (melatonin and DHEA) are available without prescription (as "dietary supplements"), but there is no reason for physicians to endorse their use. □

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Diabetes-Related Leg Amputations in Elderly North Carolinians

A Status Report and a Challenge

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In North Carolina, as in the nation, diabetes affects approximately 13% of persons aged 65 and older. There is growing evidence that the incidence of diabetes is rising,¹ but less than 25% of the increase can be ascribed to aging.² Diabetes is the seventh leading cause of death,^{2,3} and a major cause of disability and excess utilization of health care resources.³ Since diabetes predisposes to heart disease and stroke, an increase in the prevalence of diabetes means a worsening of the cardiovascular disease burden in North Carolina, where the stroke rate is already one of the nation's highest.⁴

Non-traumatic lower extremity amputation (LEA) is one serious and costly complication of diabetes.^{5,6} LEA is a common sequel of the peripheral neuropathy and peripheral vascular disease that often accompany diabetes.^{5,6} There is a question of whether the increasing incidence of diabetes will lead to an increased rate of LEA among diabetics. An answer to this question is pertinent to *Healthy People 2000*, a set of national health objectives set by the US Public Health Service in 1991.⁷ One of the *Healthy People 2000* goals is the reduction of the LEA rate to less than 4.9/1000 diabetic adults and less than 6.1/1000 diabetic African-American adults (the group at highest risk). Since about half of diabetes-related leg amputations occur in persons aged 65 or older,⁸ we set out to document the hospitalization rate and secular trend of hospitalization for LEA among the Medicare population of North Carolina over the period 1994-1998. We also looked at related demographic factors associated with amputation, and compared our data with the national objectives of *Healthy People 2000*.

Data and Methods

We used data derived from North Carolina Medicare hospital claims filed for persons aged 65 and older from 1994 through 1998. We included all hospitalizations with a primary or secondary diagnosis indicating diabetes (ICD-9-CM codes 250.xx). We identified LEA by ICD-9-CM procedure code 84.1x. We had available Medicare claims information on patient age, gender, and race; hospital admission and discharge dates; diagnoses and procedures; inpatient death or discharge destination; and total expenditure at discharge. Each patient's county of residence was obtained from the North Carolina Medicare enrollment database. Following state health department report procedures, we classified counties of residence as rural if the population density was less than 190 residents/square mile, and urban if the density was 190 residents or more.⁹ The hospitalization rate for LEA (that is, the number of LEA hospitalizations/1000 diabetes-related hospitalizations) was age-standardized by gender, race, and residence categories, using the 1990 Census population as standard.

Medicare hospitalization data do not permit a calculation of amputation rates for the entire population (needed for direct comparison to the *Healthy People 2000* goals), because the goal values apply to all adult individuals with diabetes. However, the ratio of the number of LEAs among Medicare enrollees aged 65 and older with diabetes to the number of all adults with diabetes will give a lower bound for the *Healthy People 2000* rate. This synthetic ratio basically denotes the contribution of Medicare enrollees to the whole population LEA rate; if the calculated lower bound already exceeds the *Healthy People 2000* goal rate, then the goal cannot be met (that is, the numerator may be larger, but not the denominator, which includes all adult individuals with diabetes in the population). We obtained data on the number of North Carolina adults with diabetes from the state's

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Table 1. Characteristics of North Carolina Medicare population hospitalized for diabetes-related lower extremity amputation, 1994-98.

| | 1994 | 1995 | 1996 | 1997 | 1998 |
|--|----------|----------|----------|----------|----------|
| Number of hospitalizations | 1309 | 1470 | 1334 | 1496 | 1508 |
| Age: 65-79 | 73% | 74% | 75% | 75% | 73% |
| 80+ | 27% | 26% | 25% | 25% | 27% |
| African-American race | 43% | 42% | 38% | 39% | 42% |
| Men | 49% | 48% | 51% | 50% | 48% |
| Lower extremity ulcer conditions* | 94% | 93% | 93% | 92% | 95% |
| Abscess | 14% | 15% | 14% | 18% | 16% |
| Chronic ulcer | 26% | 27% | 25% | 25% | 27% |
| Osteomyelitis | 18% | 20% | 13% | 12% | 18% |
| Atherosclerosis of extremity with ulceration | 3% | 3% | 4% | 4% | 4% |
| Atherosclerosis of extremity with gangrene | 42% | 45% | 50% | 49% | 50% |
| Gangrene | 38% | 36% | 30% | 29% | 28% |
| Discharged to facilities† | 39% | 43% | 45% | 52% | 56% |
| Died in hospital | 6.9% | 6.5% | 6.4% | 5.2% | 4.8% |
| Length of stay (days) | | | | | |
| Mean | 14.6 | 13.9 | 12.5 | 12.1 | 11.4 |
| (Q ₁ , Q ₃)‡ | (7,18) | (6,18) | (6,15) | (6,15) | (5,14) |
| Mean total cost at discharge | \$18,588 | \$18,974 | \$18,489 | \$18,599 | \$18,969 |
| ±standard error | ±479 | ±527 | ±567 | ±474 | ±484 |

*Conditions are defined according to ICD-9-CM coding and are not mutually exclusive.

†Skilled nursing facilities, rehabilitation centers, intermediate care facilities, and short term hospitals.

‡Q₁ and Q₃ respectively represent the bottom 25% and top 25% levels of observed values.

Diabetes Control Program covering the period 1993-1997.¹⁰ We estimated the value for 1998 by extrapolation from annual figures of the preceding five years.

Results

During the period 1994-98, Medicare enrollees aged 65 and older had a total of 283,782 hospitalizations in which diabetes was listed as a diagnosis. One or more leg disorders were also listed for 27,354 (9.6%) of these hospitalizations, with chronic ulcer being the most common (53% of the total), followed by lower extremity abscess (27%) and atherosclerosis of the extremity with gangrene (16%). LEA was recorded on 24% of the 27,354 hospitalizations with, but on less than 0.2% of hospitalizations without, recorded leg disorders.

Of the 283,782 hospitalizations listing diabetes, a total of 7,117 also listed LEA (see Table 1). Most of the amputees

were between 65 and 79 years old, and the proportion of African-Americans ranged from 38-43%. An overwhelming majority (92%) of amputations were associated with ulcerative conditions. Discharge of patients to other health care facilities rather than to home was considerable and increased from 39% in 1994 to 56% in 1998. Average length of hospital stay declined every year from 14.6 days in 1994 to 11.4 days in 1998. There was also a consistent decline in the inpatient death rate from 6.9% in 1994 to 4.8% in 1998. The average charges per hospitalization varied little from year to year (\$18,588 to \$18,969).

During the five-year study period, there were 25.1 hospitalizations for leg amputation/1000 diabetes-related hospitalizations; this rate showed a slight downward trend from 27.1 in 1994 to 24.5 in 1998 (Table 2a). The rate for individuals aged 80 and older was higher than for those aged 65-79 in 1994, but the differences in subsequent years were not large. Rates of hospitalization due to LEA were consistently higher for men and for African-Americans (Table 2b),

Table 2. Number of hospitalizations for lower extremity amputations/1000 hospitalizations for diabetes

| | a. By age | | | b. By race and gender* | | | |
|------|-----------|---------|---------|------------------------|------|------------------|------|
| | All Races | | | White | | African-American | |
| | Age 65-79 | Age 80+ | Age 65+ | Women | Men | Women | Men |
| 1994 | 26.1 | 30.4 | 27.1 | 15.4 | 26.5 | 39.1 | 61.0 |
| 1995 | 26.8 | 27.8 | 27.1 | 15.7 | 27.9 | 40.0 | 55.1 |
| 1996 | 23.1 | 22.4 | 22.9 | 14.1 | 25.9 | 29.3 | 43.4 |
| 1997 | 24.6 | 23.7 | 24.3 | 13.9 | 27.4 | 33.9 | 42.5 |
| 1998 | 24.1 | 25.6 | 24.5 | 15.5 | 23.6 | 33.8 | 48.9 |

*Rates are age-standardized.

Table 3. Age- and race-standardized number of hospitalizations for lower extremity amputation/1000 hospitalizations for diabetes, by area of residence

| | Rural | Urban |
|------|-------|-------|
| 1994 | 21.4 | 24.6 |
| 1995 | 19.5 | 28.4 |
| 1996 | 19.4 | 22.2 |
| 1997 | 21.0 | 22.1 |
| 1998 | 19.7 | 22.6 |

and rates were slightly higher in urban compared to rural areas (Table 3).

For a comparison with the *Healthy People 2000* goals, we calculated the lower bound for the LEA rate in our population (see Figure and the Appendix for details). Among all adults in 1994, the lower bound of 6.0/1000 was 23% above the *Healthy People 2000* target rate (4.9 or lower), but this excess decreased to 8% (5.3/1000) in 1997. The estimated rate for 1998 has limited statistical precision because of the scanty data available in denominator estimation, but the overall trend is approaching the *Healthy People 2000* target. In contrast to the population as a whole, the calculated lower bound for African-Americans was 75% above the target rate in 1994 (10.7/1000) and at 8.1/1000 remained 32% above the target (6.1 or lower) in 1998.

Discussion

We used Medicare hospital claims to analyze all non-traumatic leg amputations in elderly Medicare residents of North

Carolina. Our basic purpose was to layout and display measures of LEA surveillance in this population, but our results should be interpreted with caution. First, the data reflect only hospitalizations, so that individual patients may have been counted more than once during the study period. Repeat admissions were noted in 15% of LEA patients, but most had only two admissions during the study period. Second, in order to compare our results to the *Healthy People 2000* objectives, we calculated a synthetic ratio (the number of lower extremity amputations in Medicare enrollees age 65 and older with diabetes per 1000 adults in North Carolina with diabetes). For 1998, the denominator was extrapolated from the 1993-97 data and has limited statistical precision; it should nevertheless reflect the trend over a short time frame. Third, there may be some modest under-reporting of diabetes diagnosis codes on LEA claims among diabetic patients. In California, such under-reporting was estimated to occur in only 7.5% of claims, and the author of that study concluded this would not affect risk monitoring (from a personal communication from Olson RK). In addition, since under-reporting decreases the number of amputations identified, the rates we report here are conservative, not inflated. This means that our general conclusions would not be changed.

Despite these caveats, our study provides useful information about LEA in elderly Medicare patients, and it documents the magnitude of this critical public health problem in North Carolina. The Medicare data for LEA during the five-year period 1994-98 revealed no major improvement in amputation rates (Table 2a) despite the high economic burden imposed by this problem. The slight decline noted in the rate of hospitalization for LEA (from 27.1/1000 in 1994 to

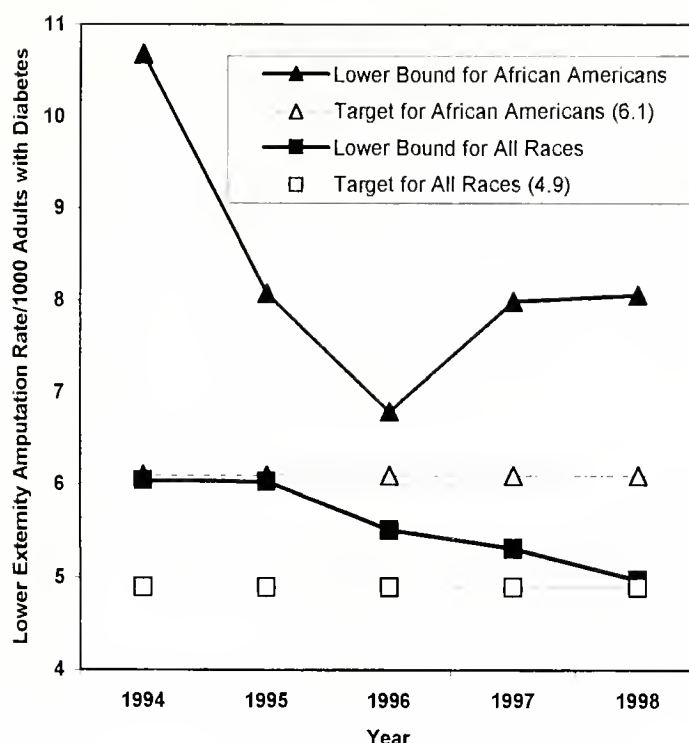


Figure. Lower bound for lower extremity amputation rate/1000 diabetic adults in North Carolina, 1994-98.

24.5/1000 in 1998) does not necessarily mean a reduced total number of LEAs, in part because of the rapidly rising incidence of diabetes.¹ The rate of LEA is more of a problem among African-Americans than among whites because the former are disproportionately affected^{2,6} and their numbers grow. Consistent with previous studies,² we found that men were more affected than women, and that older persons living in urban areas had somewhat higher hospitalization rates for LEA than did those residing in the rural areas.

Our method of comparing LEA rates to the *Healthy People 2000* goals was necessitated by the fact that Medicare claims do not provide the type of numerator and denominator data needed to calculate *Healthy People 2000* rates for LEA. So we used a synthetic ratio to calculate a lower bound for the LEA rate in population with diabetes. This ratio showed that North Carolina's LEA rate was at least 23% above the *Healthy People 2000* target for all races in 1994, but the excess had narrowed to not less than 2% in 1998. Still, the fact that the lower bound remains above target indicates that the *Healthy People 2000* goal is unlikely to be met in North Carolina. The downward trend of calculated lower bound (Figure) suggests that Medicare enrollees did not have an increasing contribution to the LEA rate among diabetic adults during the study period, a conclusion supported by the rates of hospitalization for LEA (Table 2a). On the other hand, the

lower bound we calculated for African-Americans was and remained so high that there is no hope that the *Healthy People 2000* goal will be met for this group.

In conclusion, we found a modest decline in the hospitalization rate for LEA among Medicare enrollees with diabetes, but no strong indication that the *Healthy People 2000* goals will be reached. Some national groups are set to modify current objectives into the year 2010,^{7,11} but our surveillance data suggest only that we need to further intensify present prevention efforts, particularly among African-Americans. There is a lot of room for improvement in these efforts, as shown by a survey of the American Orthopaedic Foot and Ankle Society, which found that 73% of diabetic patients had never been taught the principles of foot care and 41% did not have yearly foot examinations.¹² We need to do a better job of helping these diabetic patients avoid the additional personal and financial burden of amputation. □

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APPENDIX

Table A1. Adults with diabetes, and LEAs among the Medicare elderly, North Carolina 1994-1998

| Year | All | | | | African-Americans | | | |
|---|---------------------------|---------------------------------|---|---|---------------------------|---------------------------------|---|---|
| | No. adults with diabetes† | No. LEAs among Medicare elderly | Lower bound for LEAs per 1000 adults with diabetes (LB) | % excess of LB over HP 2000 target rate | No. adults with diabetes† | No. LEAs among Medicare elderly | Lower bound for LEAs per 1000 adults with diabetes (LB) | % excess of LB over HP 2000 target rate |
| 1993 | 252,873 | - | - | - | 67,552 | - | - | - |
| 1994 | 216,748 | 1309 | 6.04 | 23.25 | 53,268 | 569 | 10.68 | 75.11 |
| 1995 | 243,891 | 1470 | 6.03 | 23.00 | 77,381 | 625 | 8.08 | 32.41 |
| 1996 | 242,026 | 1334 | 5.51 | 12.49 | 74,227 | 505 | 6.80 | 11.53 |
| 1997 | 281,489 | 1496 | 5.31 | 8.46 | 73,311 | 586 | 7.99 | 31.04 |
| 1998 | 302,526‡ | 1508 | 4.98 | 1.73 | 78,778¶ | 635 | 8.06 | 32.14 |
| HP 2000 target for LEA rate per 1000 adults with diabetes | | | | | | | | |
| | | | 4.9 | | | | | |
| | | | | | | | 6.1 | |

†Source for the 1993-97 figures is state's Diabetes Control Program.¹⁰

‡Projected from the 1993-97 figures.

¶Adult population estimate times the proportion (26.04%¹⁰) of African-Americans among diabetic individuals in NC, 1997.

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— Sir William Osler

The *Journal* notes with interest the number of physicians and bioscientists who, while pursuing successful careers, have managed at the same time to conduct separate creative and intellectual lives, achieving an impressive level of proficiency—in some cases real professional distinction—in art, music, letters, or some other of the arts and humanities. We will feature one of them in these pages from time to time, and we welcome readers' suggestions.

We are beginning in this issue with a few samples from the photographic work of Dr. Deepak Bastia, professor of microbiology at Duke University Medical Center. Dr. Bastia is a specialist in molecular biology and the biochemistry of DNA replication. He is also, as evidenced in these images, a highly accomplished landscape photographer. These pictures depict seasonal aspects of

the Grand Teton Mountains of Wyoming, which, along with the Smoky Mountains of North Carolina, are among his favorite subjects.

Dr. Bastia began photography as a hobby more than 30 years ago, using 35mm Nikons. He still uses small format cameras for photographing orchids and other macrophotography, but prefers large-format cameras for his landscape studies. All of the pictures shown here were taken with a Linhof Technica IV, equipped with a 210 mm Schneider lens and a 90mm Fujinon lens.

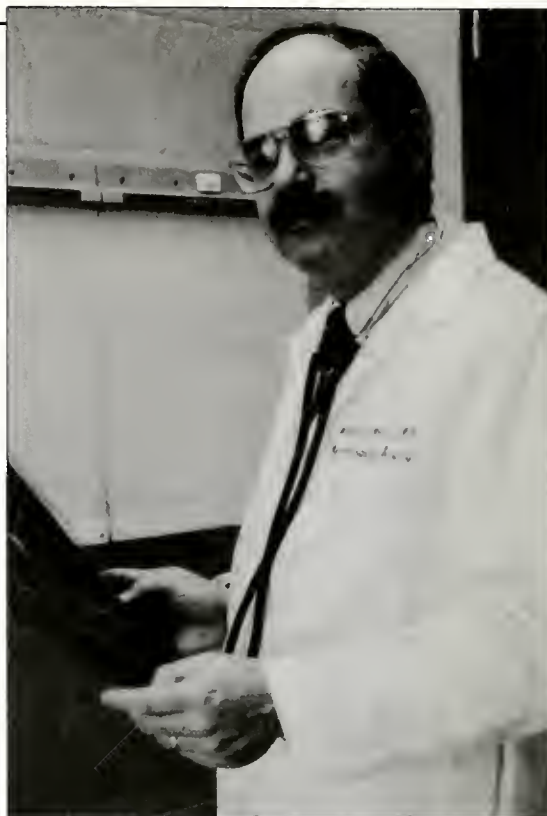
Many of Dr. Bastia's photographs have appeared in print. Recently a selection of his photographs, including a suite of these Grand Teton studies, was on display at Duke University Medical Center.





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Edward C. Halperin, MD, Book Review Editor

Coping with Color Blindness

by Odeda Rosenthal and Robert H. Phillips, PhD. Garden City Park, NY: Avery Publishing Group, 1997. \$10.95.

Reviewed by Robert N. Rosenstein, OD

This easy-to-read paperback will help health professionals care for color deficient patients and—maybe even more importantly—for their patients' families. The text is clearly geared toward the public, and the authors have done a nice job of organizing the material and laying it out succinctly.

The book is in two parts. The seven chapters in the first part, *Basics about Color Blindness*, range from "Vision and Color Perception" to "A Journey Through Color Vision Research." Except for the first and last, each chapter ends with a conclusion section.

Several sections of Part One are best read with a grain of salt. Here, time and again, the authors present information as irrefutable scientific knowledge, when in fact it represents their own biases or lack of understanding of ocular physiology. For example, the authors state on page 6, "The rest of us ought to admit that a group that makes up nearly 10 percent of the world's population deserves more understanding, not jeering laughter." In fact, approximately 10% of men and 0.5% of women have defective color vision; this hardly accounts for 10% of the world's population.

In Chapter 5, "Causes of Color Vision Confusion," the authors state, "Although [cataracts] may cause people to see the world through a red film, this is not technically a case of chromotopsia. In reality, those with cataracts are seeing the world through their own blood vessels. Once the cataract is removed, this film disappears. Cyanopsia (blue CVC) may, however, temporarily occur following removal of the cataract." There are no blood vessels in either the cornea or lens of a healthy eye, so how do patients see through their own blood vessels? The crystalline lens yellows as the cataract advances in maturity, effectively blocking the blue portion of the spectrum. It is when this yellow filter is removed that the patient often reports seeing more vivid blues.

On page 55 the authors continue with, "Another eye condition that can cause color vision distortion, glaucoma

may decrease a person's sensitivity to blue-green-yellow colors and tends to cause seeing 'halos' around lights." Short-wave automated perimetry (SWAP) is considered by some experts to be a more sensitive perimetry test for glaucoma than the standard white light used by most eye doctors today. However, it has nothing to do with seeing halos around lights. This phenomenon is caused usually by a sudden increase in intraocular pressure exceeding the capacity of the corneal endothelial pumps to remove the fluid. The resulting corneal edema can produce symptoms of blurred vision and the perception of colored haloes around lights.

Part Two, *Living with Color Blindness*, is where this book shines. There are four chapters that take the reader through color vision testing; learning, memory, and color vision confusion; how families are affected by color vision confusion; and, finally, coping with color vision confusion. Again, each chapter is nicely finished with a conclusion section. The last two chapters concerning how families and patients can cope with color confusion are filled with excellent, practical, ready-to-use suggestions.

It is only the unfortunate inclusion of scientific misstatements that keeps this text from being excellent. After several of these, the scientific reader becomes rattled and begins to wonder about the accuracy of the remainder of the book. All that considered, I believe this to be a good work, and one that I would recommend to my patients, even though Part One needs to be read with a grain of salt.

Readers are invited to submit for review books of potential interest to *Journal* audiences, including works on any aspect of medicine, or by North Carolina physicians. Send them to Dr. Halperin at Box 3085, DUMC, Durham NC 27710.

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Info: Greensboro AHEC: 336/832-7795; fax 336/832-2851

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Interpreting the DASH Study: A Practical Approach to Hypertension

Place: Sarah W. Stedman Center for Nutritional Studies, Duke Center for Living
Credit: Up to 5.5 hours, Category 1, AMA
Fees: \$100 physicians; \$75 dietitians, residents, nonphysicians
Info: Brandee Hayhurst, Duke CME. Tel. 919/681-1660; hayhu001@mc.duke.edu

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Place: Searle Center, Duke University Medical Center
Credit: 12.5 hours, Category 1, AMA
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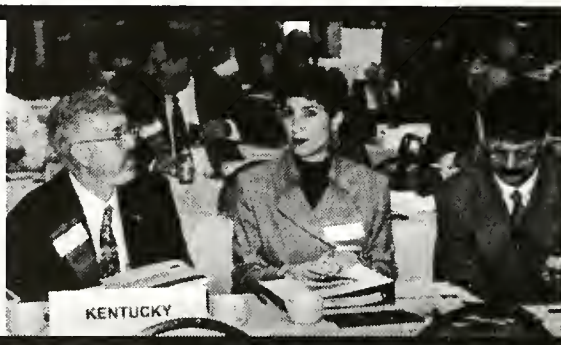
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The *Journal* will consider for publication articles relating to and illuminating medical science, practice, and history; editorials and opinion pieces; letters; personal accounts; poetry and whimsical musings; and photographs and drawings. Papers that relate to the present, past, or future practice of the health professions in North Carolina are especially pertinent, but manuscripts reflecting other perspectives or topics are welcomed. Prospective authors should feel free to discuss potential articles with the editors.

Manuscript Preparation

Prepare papers according to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (N Engl J Med 1991;324:424-8) with the following exceptions: 1) no abstract is needed; 2) no running title is needed; and 3) report measurements in metric units; use of the International System of Units (SI) is optional.

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Aphorisms of the Month

Daniel Sexton, MD, Section Editor

"Knowledge and Prognosis in Medical Practice"

It ain't so much what we don't know that gets us into trouble as what we think we know that ain't so.

— *Will Rogers*

It is that which we do know which is the great hindrance to our learning that which we do not know

— *Claude Bernard*

All knowledge comes from noticing resemblances and recurrences in the events that happen around us.

— *Wilfred Trotter*

Knowledge is a process of piling up facts; wisdom lies in their simplification.

— *Martin H. Fischer*

The best part of our knowledge is that which teaches us where knowledge leaves off and ignorance begins. Nothing more clearly separates a vulgar from a superior mind than the confusion in the first between the little that it truly knows, on the one hand, and what it half knows and what it think it knows on the other.

— *Oliver Wendell Holmes*

Patients and their families will forgive you for wrong diagnoses, but rarely will forgive you for wrong prognoses. The older you grow in medicine, the more chary you get about offering iron-clad prognoses, good or bad.

— *Albert R. Lamb*

In individual prognosis, statistics function as a weathervane. From them the practitioner recognizes the wind direction; he knows nothing of wind velocity, or of weather conditions such as temperature, humidity or visibility.

— *Harold T. Hyman*

Section editor is Dr. Dan Sexton, Box 3605, DUMC, Durham, NC 27710. e-mail: sexto002@mc.duke.edu

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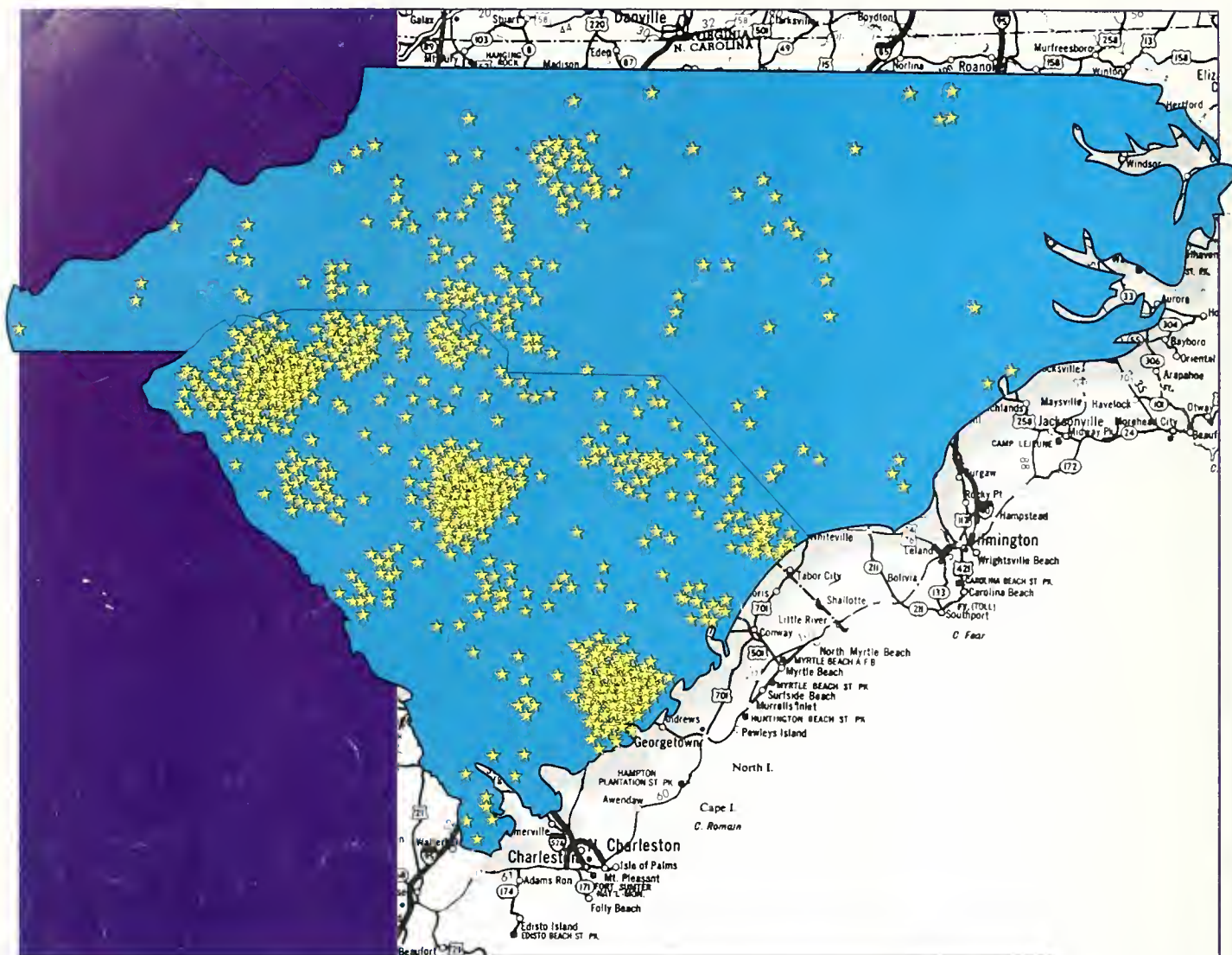
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